

# Inspection Report For Well: UT20736 - 04328

U.S. Environmental Protection Agency  
Underground Injection Control Program, 8ENF-T  
999 18th Street, Suite 300, Denver, CO 80202-2466

This form was printed on 9/24/2013

INSPECTOR(S): Lead: Roberts, Sarah

Date: 12/10/2013

Others: Ajayi, Christopher

Time: 10:00 am / pm

OPERATOR (only if different):

REPRESENTATIVE(S): Chad Steinson

## PRE-INSPECTION REVIEW

### Petroglyph Operating Company, Inc

Well Name: Ute Tribal 04-05

Well Type: Enhanced Recovery (2R)

Operating Status: AC (ACTIVE) as of 12/31/2002

Oil Field: Antelope Creek (Duchesne)

Location: SWNW S4 T5S R3W

Indian Country: X, Uintah and Ouray

Last Inspection: 8/28/2012

Allowable Inj Pressure: 1915 /

Last MIT: Pass 10/13/2009

Annulus Pressure From Last MIT: 1150

BLACK = POSSIBLE VIOLATION

GREY = DATA MISSING

INSPECTION TYPE:  
(Select One)

☐ Construction / Workover

☐ Response to Complaint

☐ Other

☐ Plugging

☒ Routine

☐ Post-Closure

☐ Witness MIT

ICIS Entered

Date 12/18/13

Initials JS

### OBSERVED VALUES:

Tubing Gauge: ☒ Yes  
☐ No

Pressure: U: 1868 / L: \_\_\_\_\_ psig  
Gauge Range: 4800 5 cat psig

Gauge Owner: ☒ EPA  
☒ Operator

Annulus Gauge: ☒ Yes  
☐ No

Pressure: \_\_\_\_\_ psig  
Gauge Range: 0-2000 psig

Gauge Owner: ☒ EPA  
☒ Operator

Bradenhead Gauge: ☐ Yes  
☐ No

Pressure: \_\_\_\_\_ psig  
Gauge Range: \_\_\_\_\_ psig

Gauge Owner: ☐ EPA  
☐ Operator

Pump Gauge: ☐ Yes  
☐ No

Pressure: \_\_\_\_\_ psig  
Gauge Range: \_\_\_\_\_ psig

Gauge Owner: ☐ EPA  
☐ Operator

Operating Status:  
(Select One) ☒ Active  
☐ Being Reworked

☐ Not Injecting  
☐ Production

☐ Plugged and Abandoned  
☐ Under Construction

U2 Entered

See page 2 for photos, comments, and site conditions.

Date 12/17/13

Initial JS

TAB	GREEN	BLUE	CBI
		1	

## Inspection Report For Well: UT20736 - 04328 (PAGE 2)

**PHOTOGRAPHS:**☐

Yes

☒

No

List of photos taken: \_\_\_\_\_

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**Comments and site conditions observed during inspection:** \_\_\_\_\_

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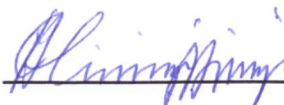
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**GPS:** GPS File ID: \_\_\_\_\_

Signature of EPA Inspector(s):

☐

Data Entry

☐

Compliance Staff

☐

Hard Copy Filing



# NOTICE OF INSPECTION



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION VIII, 999 18TH STREET - SUITE 500  
DENVER, COLORADO 80202-2405

Date: 12/10/13

Notice of inspection is hereby given according to Section 1445(b) of the Safe Drinking Water Act (42 U.S.C. §300f et seq.).

Hour: 8:00a

Firm Name: Petroglyph Operating, Inc.

Firm Address: Roosevelt, UT, Antelope Creek Oil Field

## REASON FOR INSPECTION:

For the purpose of inspecting records, files, papers, processes, controls and facilities, and obtaining samples to determine whether the person subject to an applicable underground injection control program has acted or is acting in compliance with the Safe Drinking Water Act and any applicable condition of permit or rule authorization.

## SECTION 1445(b) of the SAFE DRINKING WATER ACT is quoted below:

Section 1445(b)(1): Except as provided in Paragraph (2), the Administrator, or representatives of the Administrator duly designated by him, upon presenting appropriate credentials, and a written notice to any supplier of water or other person subject to (a), or person subject (A) a national primary drinking water regulation prescribed under Section 1412(B) an applicable Underground Injection Control Program, or (C) any requirement to monitor an unregulated contaminant pursuant to subsection (a), or person in charge of any of the property of such supplier or other person referred to in clause (A), (B), or (C), is authorized to enter any establishment, ... facility, or other property of such supplier or other person in order to determine whether such supplier or other person has acted or is acting in compliance with this title, including for this purpose, inspection, at reasonable times, of records, files, papers, processes, controls, and facilities, or in order to test any feature of a public water system, including its raw water source. The Administrator or the Comptroller General (or any representative designated by either) shall have access for the purpose of audit and examination to any records, reports, or information of a grantee which are required to be maintained under subsection (a) or which are pertinent to any financial assistance under this title.

Sarah Roberts  
Inspector's Name & Title (Print)

[Signature]  
Inspector's Signature



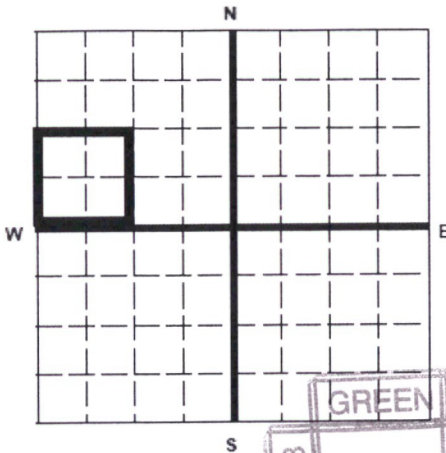
United States Environmental Protection Agency  
Washington, DC 20460

## ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee  
Petroglyph Operating Company, Inc. 2258  
P.O. Box 7608  
Boise, Idaho 83709

Name and Address of Surface Owner  
Ute Indian Tribe  
P.O. Box 70  
Ft. Duchesne, Utah, 84026

Locate Well and Outline Unit on  
Section Plat - 640 Acres



State  
Utah

County  
Duchesne

Permit Number  
UT2736-04328

Surface Location Description

1/4 of 1/4 of SW 1/4 of NW 1/4 of Section 4 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 2732 ft. from (N/S) N Line of quarter section  
and 660 ft. from (E/W) W Line of quarter section.

WELL ACTIVITY

- ☐ Brine Disposal  
☒ Enhanced Recovery  
☐ Hydrocarbon Storage

TYPE OF PERMIT

- ☐ Individual  
☒ Area

Number of Wells 11

U2 Entered

Date 3/24/17

Initial JS

Lease Name Ute Indian Tribe

Well Number UTE TRIBAL 04-05

INJECTION PRESSURE

TOTAL VOLUME INJECTED

TUBING -- CASING ANNULUS PRESSURE  
(OPTIONAL MONITORING)

MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	16	484	491	0		0	0
February	16	449	471	0		0	0
March	16	535	920	544		0	0
April	16	1190	1305	3828		0	0
May	16	1433	1538	5310		0	0
June	16	1582	1635	6150		0	0
July	16	1636	1659	5956		0	0
August	16	1696	1709	6059		0	0
September	16	1705	1715	5585		0	0
October	16	1722	1744	7268		0	0
November	16	1715	1743	6361		0	0
December	16	1751	1754	5665		0	0

### Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Chad Stevenson, Water Facilities Supervisor

Signature

Date Signed

03/21/2017



Units of Measurement: **Standard**

## Water Analysis Report

Production Company: **PETROGLYPH OPERATING CO INC - EBUS**Sales Rep: **James Patry**Well Name: **PETROGLYPH TRIBE 04-05 , DUCHESNE**Lab Tech: **Kaitlyn Natelli**Sample Point: **Well Head**Sample Date: **1/6/2017**Scaling potential predicted using ScaleSoftPitzer from  
Brine Chemistry Consortium (Rice University)Sample ID: **WA-345340**

Sample Specifics		Analysis @ Properties in Sample Specifics			
		Cations		Anions	
		mg/L		mg/L	
Test Date:	1/25/2017	Sodium (Na):	1788.74	Chloride (Cl):	2000.00
System Temperature 1 (°F):	300	Potassium (K):	12.18	Sulfate (SO <sub>4</sub> ):	80.00
System Pressure 1 (psig):	2000	Magnesium (Mg):	18.54	Bicarbonate (HCO <sub>3</sub> ):	1464.00
System Temperature 2 (°F):	130	Calcium (Ca):	35.67	Carbonate (CO <sub>3</sub> ):	
System Pressure 2 (psig):	50	Strontium (Sr):	1.91	Hydroxide (HO):	
Calculated Density (g/ml):	1.0010	Barium (Ba):	6.88	Acetic Acid (CH <sub>3</sub> COO)	
pH:	8.10	Iron (Fe):	12.52	Propionic Acid (C <sub>2</sub> H <sub>5</sub> COO)	
Calculated TDS (mg/L):	5436.05	Zinc (Zn):	1.69	Butanoic Acid (C <sub>3</sub> H <sub>7</sub> COO)	
CO <sub>2</sub> in Gas (%):		Lead (Pb):	0.07	Isobutyric Acid ((CH <sub>3</sub> ) <sub>2</sub> CHCOO)	
Dissolved CO <sub>2</sub> (mg/L):	0.00	Ammonia NH <sub>3</sub> :		Fluoride (F):	
H <sub>2</sub> S in Gas (%):		Manganese (Mn):	0.12	Bromine (Br):	
H <sub>2</sub> S in Water (mg/L):	5.00	Aluminum (Al):	0.11	Silica (SiO <sub>2</sub> ):	13.73
Tot. Suspended Solids (mg/L):		Lithium (Li):	2.74	Calcium Carbonate (CaCO <sub>3</sub> ):	
Corrosivity (Langlier Sat. Index):	0.00	Boron (B):	2.12	Phosphates (PO <sub>4</sub> ):	4.78
Alkalinity:		Silicon (Si):	6.42	Oxygen (O <sub>2</sub> ):	

## Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO <sub>4</sub> ·2H <sub>2</sub> O		Celestite SrSO <sub>4</sub>		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
130.00	50.00	1.22	26.41	1.26	3.86	3.57	4.54	2.86	9.09	0.00	0.00	0.00	0.00	0.00	0.00	10.27	0.88
149.00	267.00	1.28	27.06	1.17	3.80	3.53	4.53	2.96	9.09	0.00	0.00	0.00	0.00	0.00	0.00	10.02	0.88
168.00	483.00	1.38	27.94	1.09	3.75	3.52	4.53	3.08	9.10	0.00	0.00	0.00	0.00	0.00	0.00	9.82	0.88
187.00	700.00	1.48	28.71	1.04	3.70	3.54	4.54	3.19	9.10	0.00	0.00	0.00	0.00	0.00	0.00	9.65	0.88
206.00	917.00	1.59	29.34	1.00	3.67	3.58	4.54	3.30	9.10	0.00	0.00	0.00	0.00	0.00	0.00	9.50	0.88
224.00	1133.00	1.71	29.84	0.98	3.65	3.64	4.54	3.41	9.10	0.00	0.00	0.00	0.00	0.00	0.00	9.38	0.88
243.00	1350.00	1.83	30.23	0.97	3.63	3.71	4.54	3.50	9.10	0.00	0.00	0.00	0.00	0.00	0.00	9.27	0.88
262.00	1567.00	1.96	30.52	0.97	3.64	3.80	4.54	3.60	9.10	0.00	0.00	0.00	0.00	0.00	0.00	9.19	0.88
281.00	1783.00	2.09	30.73	0.98	3.65	3.89	4.54	3.68	9.10	0.00	0.00	0.00	0.00	0.00	0.00	9.11	0.88
300.00	2000.00	2.23	30.88	1.00	3.67	4.00	4.54	3.76	9.10	0.00	0.00	0.00	0.00	0.00	0.00	9.05	0.88



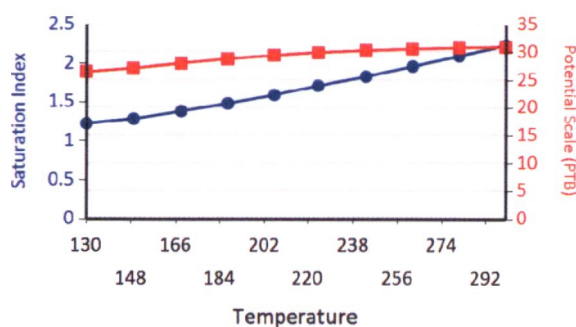
Water Analysis Report

Temp (°F)	PSI	Hemihydrate CaSO <sub>4</sub> ~0.5H <sub>2</sub> O		Anhydrate CaSO <sub>4</sub>		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
130.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	1.66	1.11	10.60	0.03	2.01	10.32	0.64	3.80	9.47	9.71
149.00	267.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87	1.12	10.17	0.03	2.79	14.34	1.07	6.21	9.97	9.72
168.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08	1.13	9.81	0.03	3.68	19.14	1.58	9.16	10.60	9.73
187.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28	1.13	9.50	0.03	4.56	23.55	2.09	11.92	11.25	9.73
206.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	2.46	1.13	9.22	0.03	5.43	27.27	2.60	14.26	11.90	9.73
224.00	1133.00	0.00	0.00	0.00	0.00	0.00	0.00	2.62	1.13	8.97	0.03	6.28	30.16	3.10	16.00	12.54	9.74
243.00	1350.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	1.14	8.75	0.03	7.10	32.24	3.59	17.13	13.18	9.74
262.00	1567.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90	1.14	8.56	0.03	7.89	33.64	4.07	17.79	13.81	9.74
281.00	1783.00	0.00	0.00	0.00	0.00	0.00	0.00	3.01	1.14	8.39	0.03	8.65	34.55	4.52	18.15	14.41	9.74
300.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	3.11	1.14	8.23	0.03	9.38	35.09	4.96	18.34	14.99	9.74

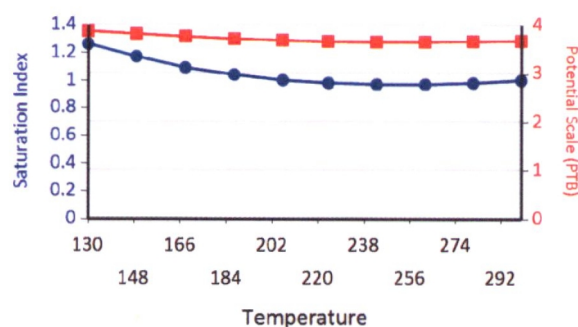
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate

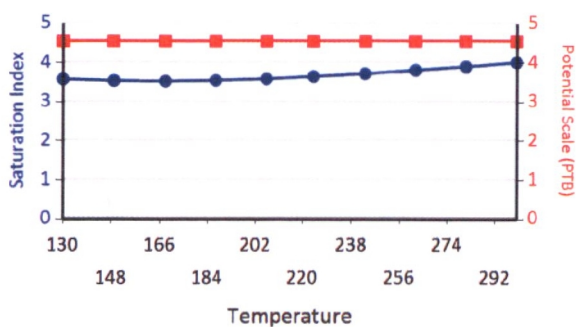
Calcium Carbonate



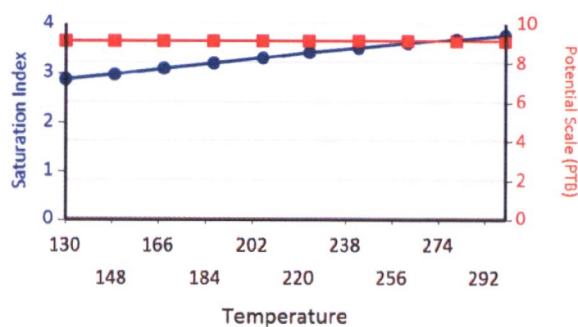
Barium Sulfate



Iron Sulfide

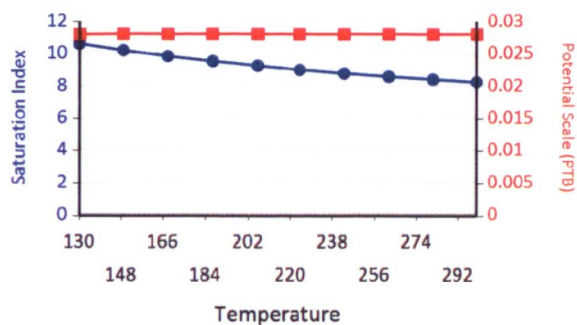


Iron Carbonate

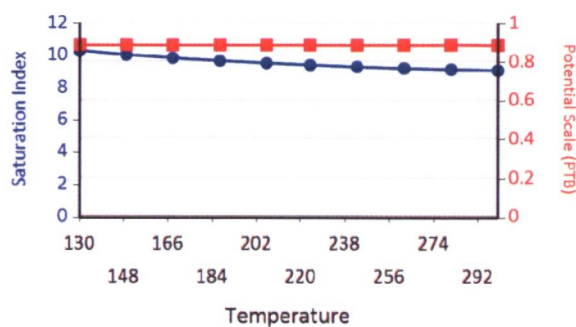


## Water Analysis Report

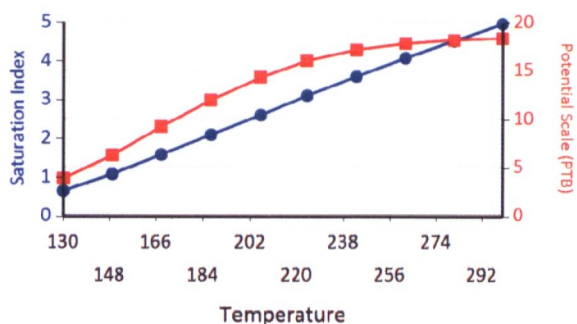
Lead Sulfide



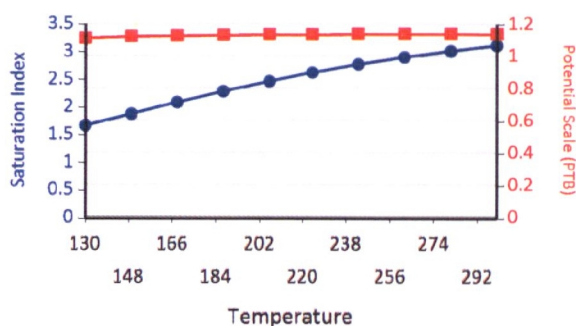
Zinc Sulfide



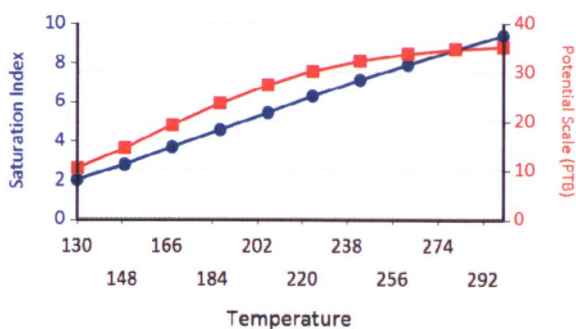
Ca Mg Silicate



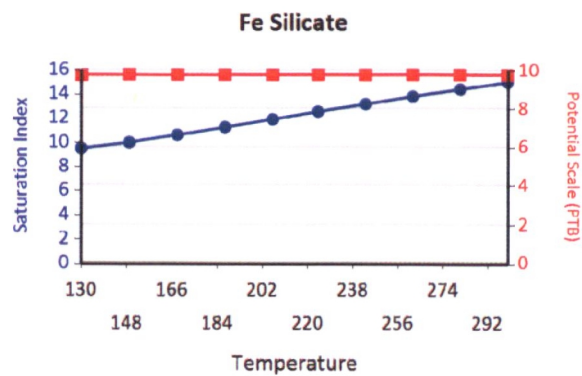
Zinc Carbonate



Mg Silicate



Water Analysis Report







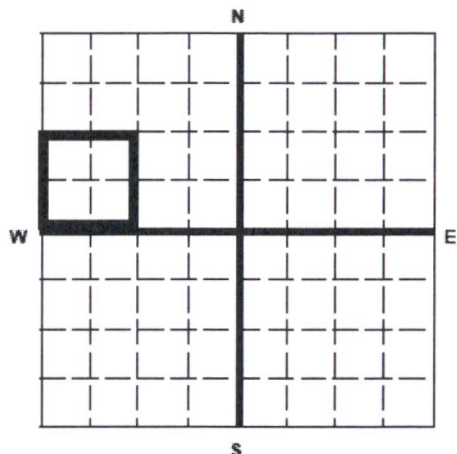
United States Environmental Protection Agency  
Washington, DC 20460

## ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee  
Petroglyph Operating Company, Inc. 2258  
P.O. Box 7608  
Boise, Idaho 83709

Name and Address of Surface Owner  
Ute Indian Tribe  
P.O. Box 70  
Ft. Duchesne, Utah, 84026

Locate Well and Outline Unit on  
Section Plat - 640 Acres



State  
Utah

County  
Duchesne

Permit Number  
UT2736-04434-04328

Surface Location Description

1/4 of 1/4 of SW 1/4 of NW 1/4 of Section 4 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 2732 ft. from (N/S) N Line of quarter section  
and 660 ft. from (E/W) W Line of quarter section.

U2 Entered

WELL ACTIVITY

- ☐ Brine Disposal  
☒ Enhanced Recovery  
☐ Hydrocarbon Storage

TYPE OF PERMIT

- ☐ Individual  
☒ Area  
Number of Wells 111

Date 2/29/16  
Initial JB

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 04-05

INJECTION PRESSURE				TOTAL VOLUME INJECTED		TUBING - CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	15	1785	1809	3976		0	0
February	15	1844	1862	4001		0	0
March	15	1839	1868	4877		0	0
April	15	1786	1849	4575		0	0
May	15	1103	1192	0		0	0
June	15	912	975	0		0	0
July	15	795	846	0		0	0
August	15	709	735	0		0	0
September	15	647	669	0		0	0
October	15	593	624	0		0	0
November	15	557	565	0		0	0
December	15	473	545	0		0	0

### Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Chad Stevenson, Water Facilities Supervisor

Signature

Date Signed

02/08/2016



Units of Measurement: Standard

## Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS

Sales Rep: James Patry

Well Name: PETROGLYPH TRIBE 04-05, DUCHESNE

Lab Tech: Michele Pike

Sample Point: Well Head

Sample Date: 1/6/2016

Scaling potential predicted using ScaleSoftPitzer from  
Brine Chemistry Consortium (Rice University)

Sample ID: WA-327695

Sample Specifics		Analysis @ Properties in Sample Specifics			
		Cations	mg/L	Anions	mg/L
Test Date:	1/14/2016	Sodium (Na):	1412.26	Chloride (Cl):	2000.00
System Temperature 1 (°F):	60	Potassium (K):	3.40	Sulfate (SO4):	30.00
System Pressure 1 (psig):	2000	Magnesium (Mg):	27.62	Bicarbonate (HCO3):	610.00
System Temperature 2 (°F):	180	Calcium (Ca):	51.76	Carbonate (CO3):	
System Pressure 2 (psig):	50	Strontium (Sr):	0.83	Acetic Acid (CH3COO)	
Calculated Density (g/ml):	1.0001	Barium (Ba):	0.31	Propionic Acid (C2H5COO)	
pH:	7.90	Iron (Fe):	16.92	Butanoic Acid (C3H7COO)	
Calculated TDS (mg/L):	4161.92	Zinc (Zn):	0.60	Isobutyric Acid ((CH3)2CHCOO)	
CO2 in Gas (%):		Lead (Pb):	0.59	Fluoride (F):	
Dissolved CO2 (mg/L):	40.00	Ammonia NH3:		Bromine (Br):	
H2S in Gas (%):		Manganese (Mn):	0.23	Silica (SiO2):	7.40
H2S in Water (mg/L):	20.00	Aluminum (Al):	0.00	Calcium Carbonate (CaCO3):	
Tot. Suspended Solids (mg/L):		Lithium (Li):	1.26	Phosphates (PO4):	124.05
Corrosivity (Langlier Sat. Indx)	0.00	Boron (B):	0.98	Oxygen (O2):	
Alkalinity:		Silicon (Si):	3.46		

## Notes:

(PTB = Pounds per Thousand Barrels)

Temp (°F)	PSI	Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180.00	50.00	1.15	30.35	0.00	0.00	4.08	9.33	2.72	12.26	0.00	0.00	0.00	0.00	0.00	0.00	9.78	0.31
167.00	267.00	1.01	26.52	0.00	0.00	4.00	9.33	2.57	12.24	0.00	0.00	0.00	0.00	0.00	0.00	9.84	0.31
153.00	483.00	0.92	23.81	0.00	0.00	3.98	9.33	2.45	12.21	0.00	0.00	0.00	0.00	0.00	0.00	9.96	0.31
140.00	700.00	0.82	21.16	0.00	0.00	3.97	9.33	2.33	12.18	0.00	0.00	0.00	0.00	0.00	0.00	10.09	0.31
127.00	917.00	0.74	18.63	0.00	0.00	3.97	9.33	2.21	12.14	0.00	0.00	0.00	0.00	0.00	0.00	10.23	0.31
113.00	1133.00	0.66	16.28	0.00	0.00	3.99	9.33	2.10	12.10	0.00	0.00	0.00	0.00	0.00	0.00	10.40	0.31
100.00	1350.00	0.58	14.17	0.00	0.00	4.02	9.33	1.98	12.03	0.00	0.00	0.00	0.00	0.00	0.00	10.59	0.31
87.00	1567.00	0.52	12.31	0.00	0.00	4.07	9.33	1.87	11.95	0.00	0.00	0.00	0.00	0.00	0.00	10.79	0.31
73.00	1783.00	0.46	10.72	0.00	0.00	4.15	9.33	1.77	11.85	0.00	0.00	0.00	0.00	0.00	0.00	11.02	0.31
60.00	2000.00	0.41	9.42	0.02	0.01	4.24	9.33	1.67	11.73	0.00	0.00	0.00	0.00	0.00	0.00	11.28	0.31

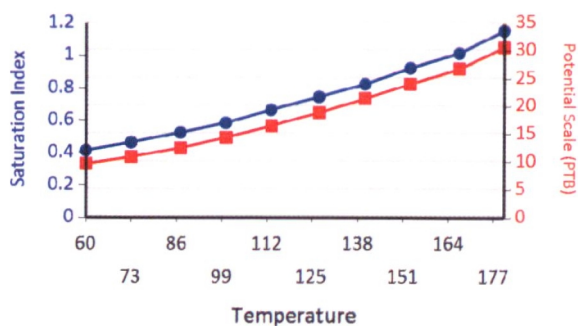
## Water Analysis Report

Temp (°F)	PSI	Hemihydrate CaSO <sub>4</sub> ~0.5H <sub>2</sub> O		Anhydrate CaSO <sub>4</sub>		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.38	11.05	0.24	3.54	12.75	1.29	4.44	9.90	13.04
167.00	267.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.37	11.22	0.24	2.58	8.90	0.70	2.36	9.10	12.92
153.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.35	11.45	0.24	1.84	6.11	0.25	0.89	8.54	12.79
140.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.33	11.70	0.24	1.11	3.50	0.00	0.00	7.98	12.59
127.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.28	11.97	0.24	0.37	1.15	0.00	0.00	7.44	12.32
113.00	1133.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.21	12.27	0.24	0.00	0.00	0.00	0.00	6.91	11.97
100.00	1350.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.10	12.61	0.24	0.00	0.00	0.00	0.00	6.40	11.52
87.00	1567.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.97	0.24	0.00	0.00	0.00	0.00	5.91	11.00
73.00	1783.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37	0.24	0.00	0.00	0.00	0.00	5.45	10.41
60.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.82	0.24	0.00	0.00	0.00	0.00	5.01	9.76

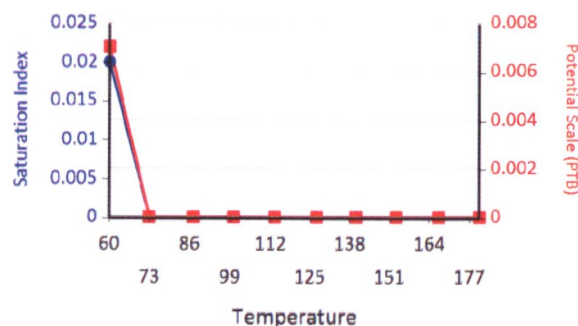
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Lead Sulfide Fe Silicate

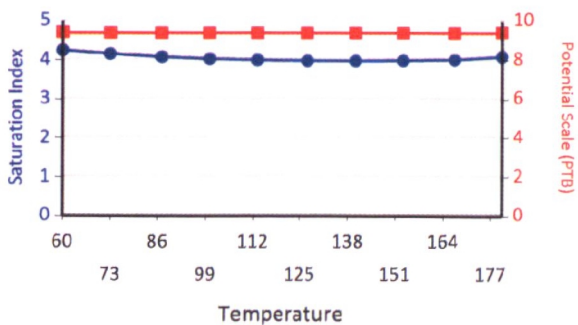
Calcium Carbonate



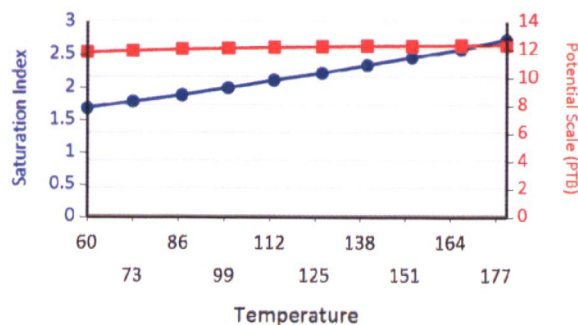
Barium Sulfate



Iron Sulfide



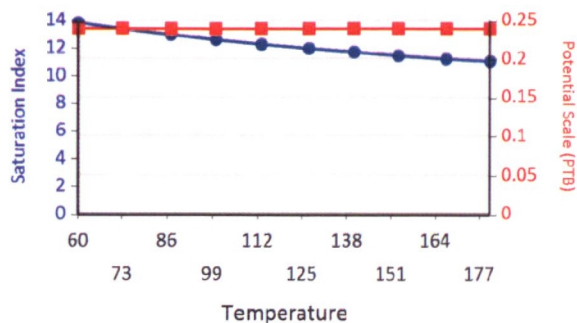
Iron Carbonate



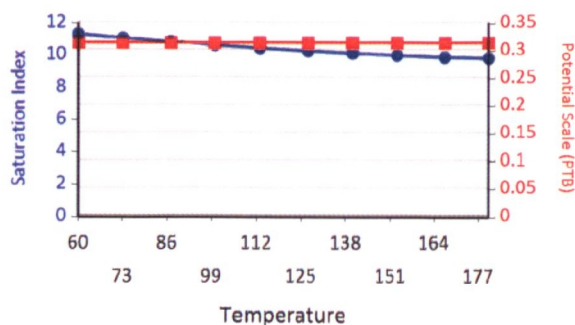


Water Analysis Report

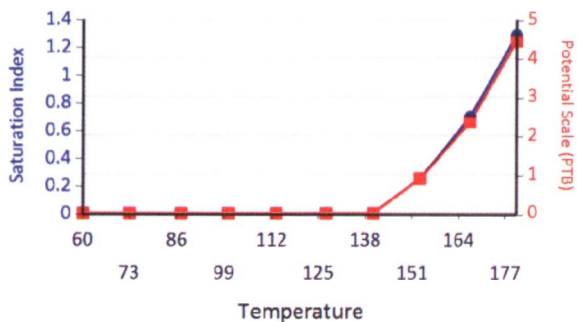
**Lead Sulfide**



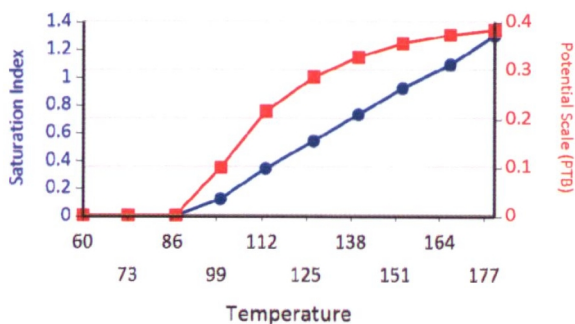
**Zinc Sulfide**



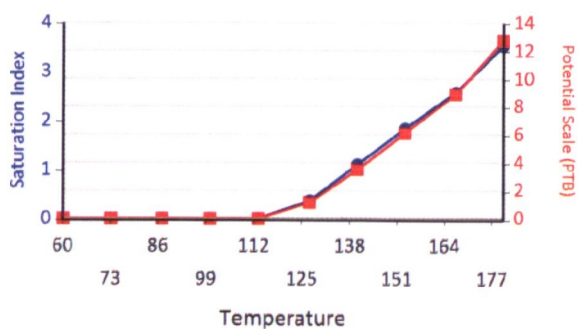
**Ca Mg Silicate**



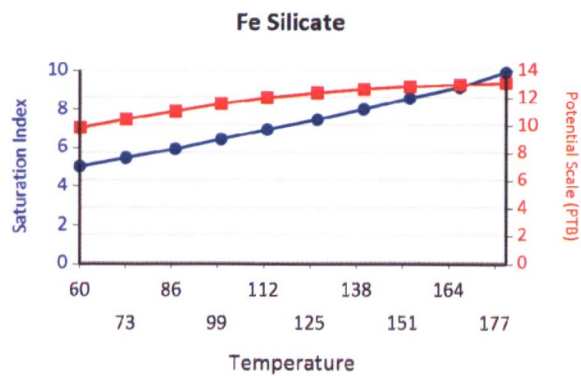
**Zinc Carbonate**



**Mg Silicate**



Water Analysis Report





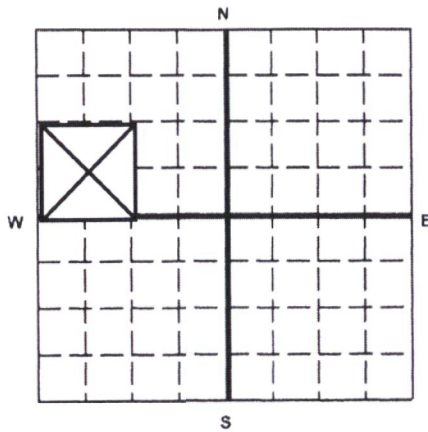
United States Environmental Protection Agency  
Washington, DC 20460

## ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee  
Petroglyph Operating Company, Inc. 2258  
P.O. Box 7608  
Boise, Idaho 83709

Name and Address of Surface Owner  
Ute Indian Tribe  
P.O. Box 70  
Ft. Duchesne, Utah 84026

Locate Well and Outline Unit on  
Section Plat - 640 Acres



State  
Utah

County  
Duchesne

Permit Number  
UT2736-04328

Surface Location Description

1/4 of 1/4 of SW 1/4 of NW 1/4 of Section 4 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 2732 ft. from (N/S) N Line of quarter section  
and 660 ft. from (E/W) W Line of quarter section.

WELL ACTIVITY

- ☐ Brine Disposal  
☒ Enhanced Recovery  
☐ Hydrocarbon Storage

TYPE OF PERMIT

- ☐ Individual  
☒ Area

Number of Wells 111

Lease Name Ute Indian Tribe

Well Number UTE TRIBAL 04-05

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	14	1862	1873	4181		0	0
February	14	1873	1877	3725		0	0
March	14	1869	1878	4347		0	0
April	14	1875	1881	4409		0	0
May	14	1865	1869	4244		0	0
June	14	1727	1853	3073		0	0
July	14	1695	1890	3467		0	0
August	14	1870	1885	4425	4297 inj monthly	0	0
September	14	1859	1890	3458		0	0
October	14	1876	1890	3783		0	0
November	14	1818	1834	3260		0	0
December	14	1842	1865	4418		0	0

### Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Chad Stevenson, Water Facilities Supervisor

Signature

Date Signed

2/10/2015

U2 Entered

Date

3/21/15

Initial

UW

	GREEN	BLUE	CBI
TAB		2	



Units of Measurement: Standard

## Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS

Sales Rep: James Patry

Well Name: PETROGLYPH TRIBE 04-05, DUCHESNE

Lab Tech: Gary Winegar

Sample Point: WELLHEAD

Sample Date: 1/7/2015

Scaling potential predicted using ScaleSoftPitzer from  
Brine Chemistry Consortium (Rice University)

Sample ID: WA-298185

Sample Specifics		Analysis @ Properties in Sample Specifics			
		Cations	mg/L	Anions	mg/L
Test Date:	1/21/2015	Sodium (Na):	1026.10	Chloride (Cl):	1000.00
System Temperature 1 (°F):	160	Potassium (K):	21.77	Sulfate (SO <sub>4</sub> ):	341.00
System Pressure 1 (psig):	1300	Magnesium (Mg):	57.88	Bicarbonate (HCO <sub>3</sub> ):	732.00
System Temperature 2 (°F):	80	Calcium (Ca):	88.98	Carbonate (CO <sub>3</sub> ):	
System Pressure 2 (psig):	15	Strontium (Sr):	4.81	Acetic Acid (CH <sub>3</sub> COO)	
Calculated Density (g/ml):	0.9996	Barium (Ba):	1.15	Propionic Acid (C <sub>2</sub> H <sub>5</sub> COO)	
pH:	6.80	Iron (Fe):	1.39	Butanoic Acid (C <sub>3</sub> H <sub>7</sub> COO)	
Calculated TDS (mg/L):	3302.16	Zinc (Zn):	0.26	Isobutyric Acid ((CH <sub>3</sub> ) <sub>2</sub> CHCOO)	
CO <sub>2</sub> in Gas (%):		Lead (Pb):	0.03	Fluoride (F):	
Dissolved CO <sub>2</sub> (mg/L):	0.00	Ammonia NH <sub>3</sub> :		Bromine (Br):	
H <sub>2</sub> S in Gas (%):		Manganese (Mn):	0.04	Silica (SiO <sub>2</sub> ):	26.75
H <sub>2</sub> S in Water (mg/L):	5.00				

## Notes:

B=2.64 Al=0 Li=.78

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO <sub>4</sub> ·2H <sub>2</sub> O		Celestite SrSO <sub>4</sub>		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.00	0.00	1.58	0.67	1.21	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.72	0.14
88.00	157.00	0.00	0.00	1.50	0.66	1.07	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.47	0.14
97.00	300.00	0.00	0.00	1.42	0.66	1.05	0.68	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	8.35	0.14
106.00	443.00	0.00	0.00	1.35	0.66	1.04	0.68	0.07	0.16	0.00	0.00	0.00	0.00	0.00	0.00	8.24	0.14
115.00	585.00	0.00	0.00	1.29	0.65	1.04	0.68	0.14	0.28	0.00	0.00	0.00	0.00	0.00	0.00	8.14	0.14
124.00	728.00	0.04	3.16	1.23	0.64	1.04	0.68	0.21	0.38	0.00	0.00	0.00	0.00	0.00	0.00	8.04	0.14
133.00	871.00	0.09	6.50	1.18	0.64	1.05	0.69	0.27	0.47	0.00	0.00	0.00	0.00	0.00	0.00	7.96	0.14
142.00	1014.00	0.13	9.94	1.14	0.63	1.07	0.69	0.34	0.54	0.00	0.00	0.00	0.00	0.00	0.00	7.88	0.14
151.00	1157.00	0.18	13.45	1.10	0.63	1.09	0.69	0.40	0.61	0.00	0.00	0.00	0.00	0.00	0.00	7.81	0.14
160.00	1300.00	0.23	17.01	1.06	0.62	1.12	0.70	0.47	0.66	0.00	0.00	0.00	0.00	0.00	0.00	7.74	0.14

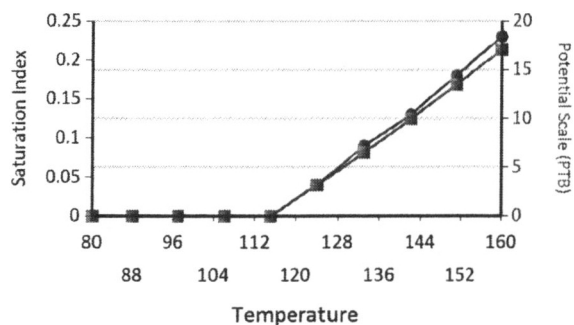
		Hemihydrate CaSO <sub>4</sub> ·0.5H <sub>2</sub> O		Anhydrate CaSO <sub>4</sub>		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00
88.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.69	0.01	0.00	0.00	0.00	0.00	0.00	0.00
97.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.47	0.01	0.00	0.00	0.00	0.00	0.00	0.00
106.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.26	0.01	0.00	0.00	0.00	0.00	0.00	0.00
115.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00
124.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.87	0.01	0.00	0.00	0.00	0.00	0.00	0.00
133.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.01	0.00	0.00	0.00	0.00	0.00	0.00
142.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.54	0.01	0.00	0.00	0.00	0.00	0.00	0.00
151.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.38	0.01	0.00	0.00	0.00	0.00	0.00	0.00
160.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.24	0.01	0.00	0.00	0.00	0.00	0.00	0.00

## Water Analysis Report

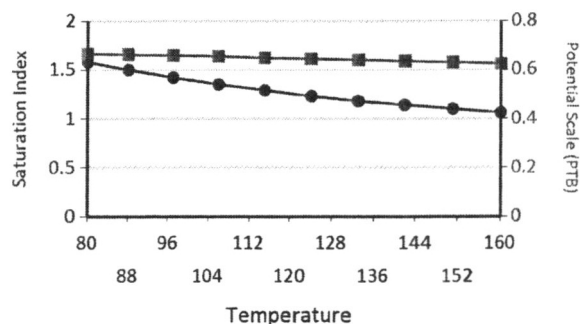
These scales have positive scaling potential under initial temperature and pressure: Barium Sulfate Iron Sulfide Zinc Sulfide Lead Sulfide

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Lead Sulfide

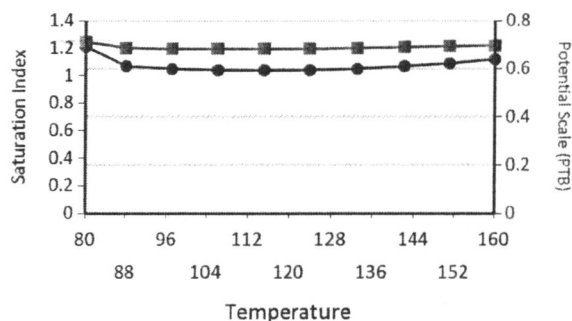
Calcium Carbonate



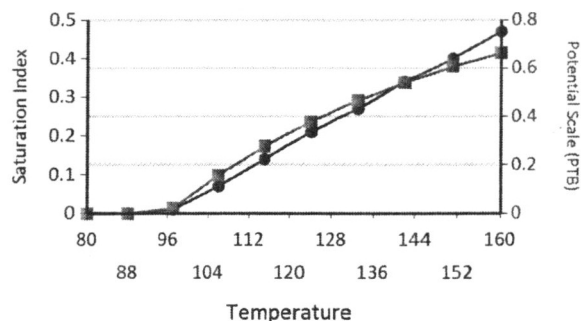
Barium Sulfate



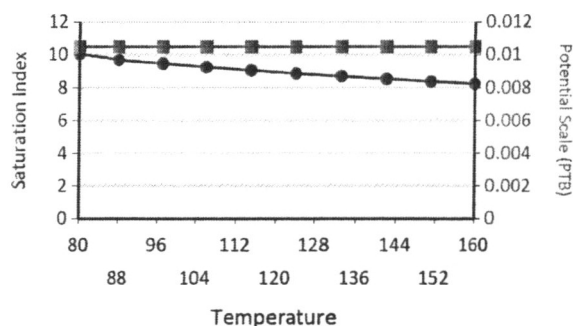
Iron Sulfide



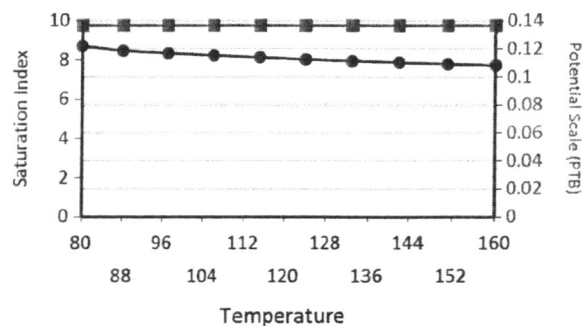
Iron Carbonate



Lead Sulfide



Zinc Sulfide







United States Environmental Protection Agency  
Washington, DC 20460

# ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

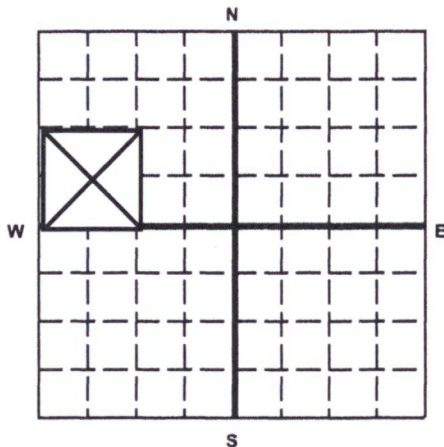
## Name and Address of Existing Permittee

Petroglyph Operating Company, Inc. 2258  
P.O. Box 7608  
Boise, Idaho 83709

## Name and Address of Surface Owner

Ute Indian Tribe  
P.O. Box 70  
Ft. Duchesne, Utah 84026

Locate Well and Outline Unit on  
Section Plat - 640 Acres



State  
Utah

County  
Duchesne

Permit Number  
UT2736-04328

## Surface Location Description

1/4 of 1/4 of SW 1/4 of NW 1/4 of Section 4 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

## Surface

Location 2732 ft. from (N/S) N Line of quarter section  
and 660 ft. from (E/W) W Line of quarter section.

## WELL ACTIVITY

- ☐ Brine Disposal  
☒ Enhanced Recovery  
☐ Hydrocarbon Storage

## TYPE OF PERMIT

- ☐ Individual  
☒ Area

Number of Wells 111

Lease Name Ute Indian Tribe

Well Number UTE TRIBAL 04-05

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	13	1785	1819	2987		0	0
February	13	1799	1818	3240		0	0
March	13	1545	1856	3500		0	0
April	13	1429	1851	4705		0	0
May	13	1833	1835	5222		0	0
June	13	1831	1841	4130		0	0
July	13	1839	1858	4565		0	0
August	13	1848	1861	4723		0	0
September	13	1831	1865	4857		0	0
October	13	1841	1865	4081		0	0
November	13	1861	1892	4305		0	0
December	13	1852	1868	3870		0	0

## Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Chad Stevenson, Water Facilities Supervisor

Signature

*Chad Stevenson*

Date Signed

2/11/2014



02 Entered

Date 3/11/14

Initial JS



Units of Measurement: **Standard**

## Water Analysis Report

Production Company: **PETROGLYPH ENERGY INC**Sales Rep: **James Patry**Well Name: **UTE TRIBAL 04-05 INJ**Lab Tech: **Gary Winegar**Sample Point: **Wellhead**Sample Date: **1/8/2014**Sample ID: **WA-262964**Scaling potential predicted using ScaleSoftPitzer from  
Brine Chemistry Consortium (Rice University)

Sample Specifics		Analysis @ Properties in Sample Specifics			
Test Date:	1/15/2014	Cations	mg/L	Anions	mg/L
System Temperature 1 (°F):	180	Sodium (Na):	4632.25	Chloride (Cl):	6000.00
System Pressure 1 (psig):	1300	Potassium (K):	65.00	Sulfate (SO4):	0.00
System Temperature 2 (°F):	60	Magnesium (Mg):	8.69	Bicarbonate (HCO3):	2244.80
System Pressure 2 (psig):	15	Calcium (Ca):	24.00	Carbonate (CO3):	
Calculated Density (g/ml):	1.006	Strontium (Sr):	5.50	Acetic Acid (CH3COO)	
pH:	8.50	Barium (Ba):	24.00	Propionic Acid (C2H5COO)	
Calculated TDS (mg/L):	13045.75	Iron (Fe):	13.00	Butanoic Acid (C3H7COO)	
CO2 in Gas (%):		Zinc (Zn):	0.28	Isobutyric Acid ((CH3)2CHCOO)	
Dissolved CO2 (mg/L):	0.00	Lead (Pb):	0.10	Fluoride (F):	
H2S in Gas (%):		Ammonia (NH3):		Bromine (Br):	
H2S in Water (mg/L):	0.00	Manganese (Mn):	0.31	Silica (SiO2):	27.82

## Notes:

B=6.2 Al=.07 Li=1.6

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
60.00	14.00	1.31	19.53	0.00	0.00	0.00	0.00	2.84	9.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73.00	157.00	1.32	19.55	0.00	0.00	0.00	0.00	2.91	9.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86.00	300.00	1.34	19.62	0.00	0.00	0.00	0.00	2.98	9.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	443.00	1.36	19.69	0.00	0.00	0.00	0.00	3.05	9.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113.00	585.00	1.39	19.78	0.00	0.00	0.00	0.00	3.11	9.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126.00	728.00	1.42	19.87	0.00	0.00	0.00	0.00	3.17	9.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140.00	871.00	1.45	19.96	0.00	0.00	0.00	0.00	3.24	9.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153.00	1014.00	1.49	20.06	0.00	0.00	0.00	0.00	3.30	9.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166.00	1157.00	1.53	20.15	0.00	0.00	0.00	0.00	3.35	9.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.00	1300.00	1.58	20.24	0.00	0.00	0.00	0.00	3.41	9.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

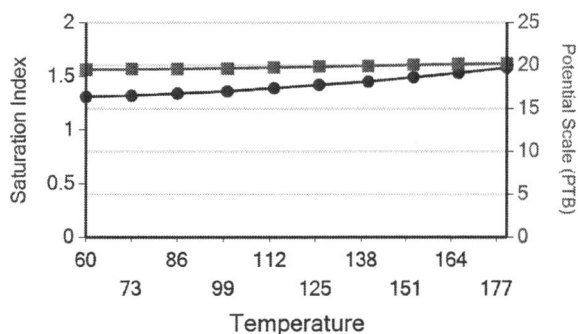
## Water Analysis Report

Temp (°F)	PSI	Hemihydrate CaSO <sub>4</sub> ·0.5H <sub>2</sub> O		Anhydrate CaSO <sub>4</sub>		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
60.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.07	0.00	0.00	0.00	0.40	0.00	0.00	9.71	10.10
73.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.12	0.00	0.00	0.48	3.20	0.11	1.38	9.92	10.10
86.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.14	0.00	0.00	1.00	5.97	0.38	3.41	10.19	10.10
100.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.16	0.00	0.00	1.54	8.43	0.66	5.38	10.48	10.10
113.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.17	0.00	0.00	2.09	10.55	0.95	7.26	10.80	10.10
126.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.17	0.00	0.00	2.64	12.33	1.25	9.01	11.13	10.11
140.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.18	0.00	0.00	3.19	13.76	1.55	10.62	11.48	10.11
153.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.18	0.00	0.00	3.75	14.86	1.86	12.05	11.84	10.11
166.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	1.51	0.18	0.00	0.00	4.30	15.67	2.16	13.30	12.20	10.11
180.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	0.18	0.00	0.00	4.85	16.24	2.47	14.34	12.57	10.11

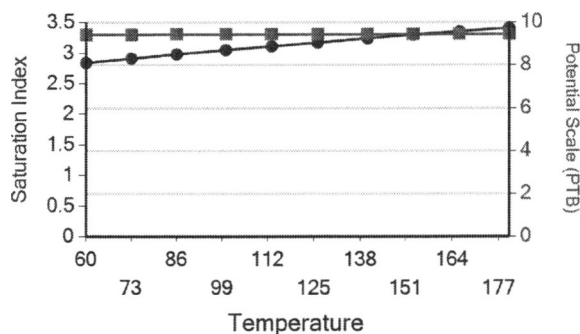
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Iron Carbonate Zinc Carbonate Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Iron Carbonate Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

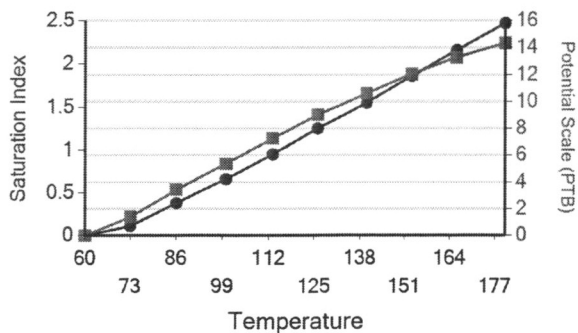
Calcium Carbonate



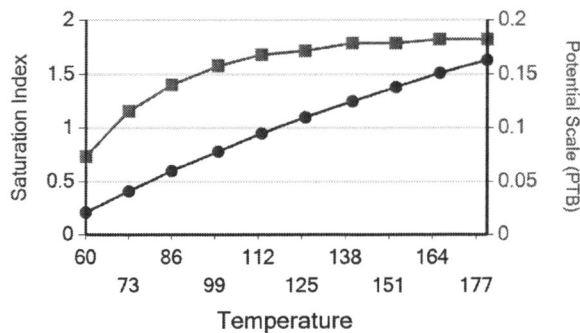
Iron Carbonate



Ca Mg Silicate

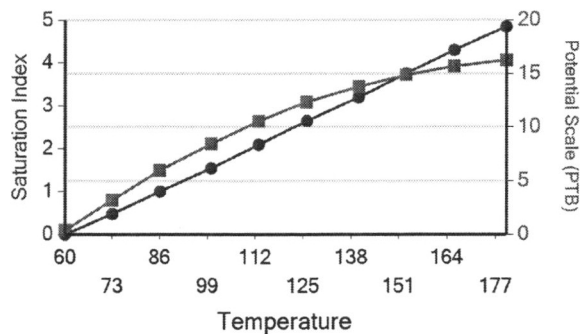


Zinc Carbonate

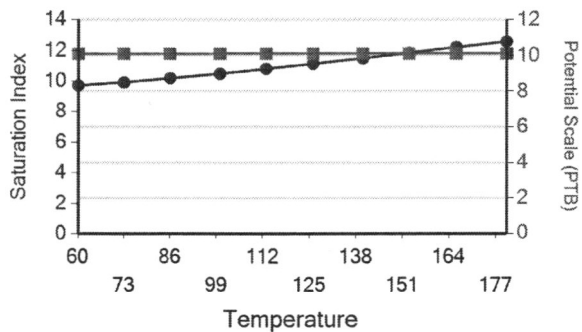


Water Analysis Report

Mg Silicate



Fe Silicate







UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET - SUITE 500  
DENVER, COLORADO 80202-2466

Ref: 8P2-W-GW

MAR - 4 1998

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Ms. Kathy Turner  
Petroleum Engineering Technician  
Petroglyph Operating Company, Inc.  
P. O. Box 1839  
Hutchinson, KS 67504-1839

RE: UNDERGROUND INJECTION CONTROL (UIC)  
**Authorization to Inject**  
**Ute Tribal #04-05 (UT04328)**  
Antelope Creek Waterflood  
EPA Area Permit No. UT2736-00000  
Duchesne County, Utah

Dear Ms. Turner:

Thank you for the recently submitted information pertaining to the above-referenced area permit and well. The Well Rework Record, injection zone fluid pore pressure survey, and the successfully run mechanical integrity test, with chart, on the Ute Tribal #04-05 (UT2736-04328) have been reviewed and approved. Petroglyph Operating Company, Inc, has complied with all of the pertinent permit conditions (Part II, Section C. 2.) for the Antelope Creek Waterflood Area Permit.

Pleased be advised that administrative approval has been granted for injection of Class II fluids into the above referenced well for enhanced recovery of oil and gas. Please also be aware of the monitoring, recordkeeping and reporting requirements described in Part II, Section D of the permit and that the current **maximum surface injection pressure (Pmax) is limited to 1915 psig**, as modified by UIC Minor Permit Modification dated June 19, 1996.

Upon receipt of this letter, the Compliance Officer, Mr. John Carson will then take over routine matters involving well operations, future correspondence, forms, and reports. Please direct all correspondence to the attention of Mr. Carson at the above letterhead (**MAIL CODE ENF-T**) or contact Mr. Carson at (303) 312-6203. Thank you for your continued cooperation.

Sincerely,

D. Edwin Hogle  
Director, Groundwater Program  
Office of Pollution Prevention  
State and Tribal Assistance



Printed on Recycled Paper

Scan under  
 UT 20736-04328  
 Authorization to Injunct-  
 Trial

P 213 403 745

3/5/98 CW 5238C

US Postal Service

**Receipt for Certified Mail**

No Insurance Coverage Provided.

Do not use for International Mail (See reverse)

Sent to	
Ms. Kathy Turner	
Street & Number	
Geology/Petroleum Engineering	
Post Office ZIP Code	
Petroglyph Operating Company,	
Post Office Box 1839	\$ Inc.
Hutchinson, KS	67504-1839
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	

PS Form 3800, April 1995



cc: Mr. Ronald Wopsock, Chairman  
Uintah & Ouray Business Committee  
Ute Indian Tribe

Ms. Elaine Willie, Environmental Director  
Ute Indian Tribe

Mr. Norman Cambridge  
BIA - Uintah & Ouray Agency

Mr. Gil Hunt  
State of Utah Natural Resources  
Division of Oil, Gas, and Mining

Mr. Jerry Kenczka  
BLM - Vernal District Office



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET - SUITE 500  
DENVER, COLORADO 80202-2466

Ref: 8P2-W-GW

MAR - 4 1998

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Sincerely,

D. Edwin Hogle  
Director, Groundwater Program  
Office of Pollution Prevention  
State and Tribal Assistance



Printed on Recycled Paper



cc: Mr. Ronald Wopsock, Chairman  
Uintah & Ouray Business Committee  
Ute Indian Tribe

Ms. Elaine Willie, Environmental Director  
Ute Indian Tribe

Mr. Norman Cambridge  
BIA - Uintah & Ouray Agency

Mr. Gil Hunt  
State of Utah Natural Resources  
Division of Oil, Gas, and Mining

Mr. Jerry Kenczka  
BLM - Vernal District Office

CONCURRENCE COPY

Ref: 8P2-W-GW

MAR 04 1998

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Ms. Kathy Turner  
Petroleum Engineering Technician  
Petroglyph Operating Company, Inc.  
P. O. Box 1839  
Hutchinson, KS 67504-1839

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Sincerely,

*19*  
D. Edwin Hogle  
Director, Groundwater Program  
Office of Pollution Prevention  
State and Tribal Assistance

*CEW*  
*8P2-W-GW*  
*2/27/98*  
*8P2-W-GW*  
*3/3/98*  
*3/4/98*

*8P2-W-GW*  
*W. Monahan*  
*3/2/98*

*Hogle*  
*8P2-W-GW*

cc: Mr. Ronald Wopsock, Chairman  
Uintah & Ouray Business Committee  
Ute Indian Tribe

Ms. Elaine Willie, Environmental Director  
Ute Indian Tribe

Mr. Norman Cambridge  
BIA - Uintah & Ouray Agency

Mr. Gil Hunt  
State of Utah Natural Resources  
Division of Oil, Gas, and Mining

Mr. Jerry Kenczka  
BLM - Vernal District Office

FCD: February 27, 1997, Chuck W., F:\DATA\WP\PETROGLF\AUT-IN04.05





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET - SUITE 500  
DENVER, COLORADO 80202-2466

JUN 19 1996

Ref: 8P2-W-GW

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Ms. Angela R. Ely  
Administrative Operations Manager  
Petroglyph Operating Company, Inc.  
6209 North Highway 61  
Hutchinson, Kansas 67502

RE: UIC Permit Minor Modification  
Conversion of Additional Wells (5)  
Antelope Creek Waterflood  
EPA Area Permit UT2736-00000  
Duchesne County, Utah

Dear Ms. Ely:

Your letter of April 3, 1996, requesting that the following five (5) wells be converted to Class II enhanced oil recovery wells and added to the Antelope Creek Waterflood, as authorized under EPA Area Permit UT2736-00000, is hereby granted.

<u>NAME</u>	<u>LOCATION</u>	<u>EPA PERMIT NO.</u>
Ute Tribal 04-01	NE NE Section 4	UT2736-04322
Ute Tribal 05-08	SE NE Section 5	UT2736-04324
Ute Tribal 29-08A	SE NE Section 29	UT2736-04325
Ute Tribal 05-16	SE SE Section 5	UT2736-04327
Ute Tribal 04-05	SW NW Section 4	UT2736-04328

These additional wells are within the boundary of the existing area permit for the Antelope Creek Waterflood (UT2736-00000), and this addition is made by minor permit modification according to the terms and conditions of that permit. Unless specifically mentioned in the Minor Permit Modification, all terms and conditions of the original permit will apply to the construction, operation, monitoring, and plugging and abandonment of these additional injection wells. The proposed well location, well schematic, conversion procedures, and revised plugging and abandonment plans and schematics submitted by your office have been reviewed and approved as follows:

- (1) The **construction** of these wells have been reviewed and found satisfactory as submitted, therefore, no corrective action is required.



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- (2) **Maximum injection pressure (Pmax)** for these wells are as follows:

$$P_{max} = [F_g - 0.433 (S_g)] d$$

Where:  $P_{max}$  = Maximum surface injection pressure at wellhead

$d$  = 4283' shallowest perforations of the five (5) wells

$S_g$  = Specific gravity of injected water

$$P_{max} = [0.88 - .433 (1.00)] 4283$$

$$P_{max} = 1915 \text{ psig}$$

Until such time as the permittee demonstrates that a fracture pressure other than 1915 psig applies to the disposal zones, of the newly converted wells, the maximum allowable wellhead injection pressure ( $P_{max}$ ) for the these wells will be 1915 psig.

- (3) The **plugging and abandonment plans and schematics**, submitted by your office, have been reviewed and approved subject to the following changes:

- (a) Prior to, or in conjunction with the emplacement of the surface plug (plug #3 in the primary plan of the permit) in the production casing, the production casing is to be perforated 2', w/4 spf, at a point 50' below the surface casing shoe and cement squeeze the perfs to 50' above the shoe. Pull out of hole (POOH) leaving a 100' cement plug inside the production casing.
- (b) The production/surface casing annulus will also be cemented from surface to a depth of 50'. A similar plug (50' to surface) will be left inside of the production casing (plug #4 in the primary plan of the permit).

**Prior to commencing injection into the above five (5) wells**, permittee must fulfill permit condition Part II, C. 2. and have received **written authorization** to inject by the EPA Director. In summary, these requirements for your newly permitted injection wells are:

- (1) All conversion is complete and the permittee has submitted a completed **Well Rework Record (EPA Form 7520-12)**.
- (2) The **pore pressure has been determined**.

- (3) The well has successfully completed and passed a **mechanical integrity test (MIT)**, guidance enclosed.

All other provisions and conditions of the permit remain as originally issued.

If you have any questions, please contact Mr. Chuck Williams at the above letterhead address, citing **MAIL CODE 8P2-W-GW** or telephone Mr. Williams at (303) 312-6625. Thank you for your continued cooperation.

Sincerely,



Kerrigan G. Clough  
Assistant Regional Administrator  
Office of Pollution Prevention,  
State and Tribal Assistance

Enclosures: Schematics - Conversion  
MIT Guidance and EPA Forms  
Well Rework Record EPA Form 7520-12

cc w/Enclosures: Mr. Ferron Secakuku  
Energy & Mineral Resource Dep't.  
Ute Indian Tribe

Mr. ~~Luke Duncan~~, <sup>person</sup> Chairman *Ruby Etwine*  
Uintah & Ouray Business Committee  
Northern Ute Tribe

Mr. Norman Cambridge  
Uintah & Ouray Agency  
BIA

Mr. Gil Hunt  
State of Utah Natural Resources  
Division of Oil, Gas, and Mining

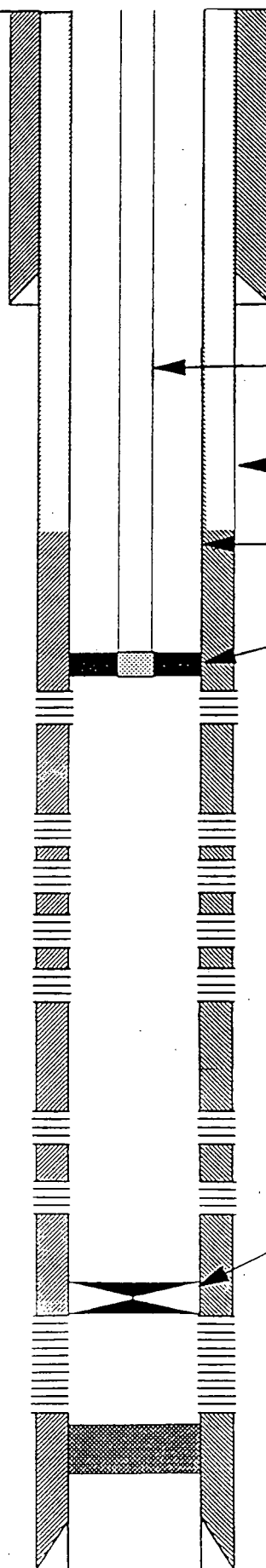
Mr. Jerry Kenczka  
BLM - Vernal District Office



**Ute Tribal #04-01  
Wellbore Diagram  
After Conversion**

**Well History:**

5/30/83	Spud Well "Coors"
6/24/83	Perf'd 6645'-35, 6525'-30, 6370'-74, Brk Dwn 2% KCl water Frac'd 76,500# sand ISIP 2,500 psi
6/30/83	Perf'd 6325'-26, 6311'-12, 6285'-86, 6269'-71, 6253'-54, 6248'-49, 6229'-31, 6190'-91, 6172'- 74, 6160'-67, 6133'-40 Brk Dwn 7½% HCl Frac'd 90,000# sand ISIP 2,500 psi
9/8/83	Perf'd 5846, 43, 40, 36, 04, 03, 02, 5800 Perf'd 5743, 33, 29, 25, 21, 15 Brk Dwn 7½% Acid Frac'd 100,716# sand ISIP 2,700 psi
11/18/83	Perf'd 5477'-92, 5111'-15, 5529'-36 Frac'd 36,000# sand ISIP 2,000 psi
8/22/84	Perf'd 5082'-86, 5281'-85 Frac'd 100,000# sand
7/26/90	Pump Changes
2/7/92	Well Shut In
11/27/92	Acid job Put well back on production



GL: 5932'

Surface Hole Size 12 1/4"

8-5/8" 24# J-55 Surface Csg @  
416' KB Cmt'd w/ 350 sxs

Tubing: 156 jts of 2-7/8" 6.5# J-55  
@ 5,010'

Hole Size: 7 7/8" bit

Cement Top @ 2945' KB  
5 1/2" 15.5# K-55 CSG @ 6680'  
Cmt'd w/ 1,500 sxs

Packer @ 5,010'

Perf's 5,082' - 5,086'  
5,281' - 5,285'  
5,422' - 5,425'  
5,438' - 5,458'  
5,477' - 5,492'  
5,511' - 5,512'  
5,529' - 5,536'  
5,715' - 5,846'

Perf's 6,133' - 6,326'  
6,370' - 6,374'

CIBP @ 6,490'

Perf's 6,525' - 6,645'

PBDT @ 6,645'

TD @ 6,698'

Tubing Detail: 2' psp Packer, 156 jts

Petroglyph Operating Co., Inc.

**Ute Tribal 04-01**

(1331' FNL & 1277' FEL)

NE NE Section 24-T5S-R3W  
Antelope Creek Field  
Duchesne Co, Utah

API #43-013 30762: Lease #14-20-H62-3503

( Not to Scale )

**Ute Tribal #05-08  
Wellbore Diagram  
After Conversion**

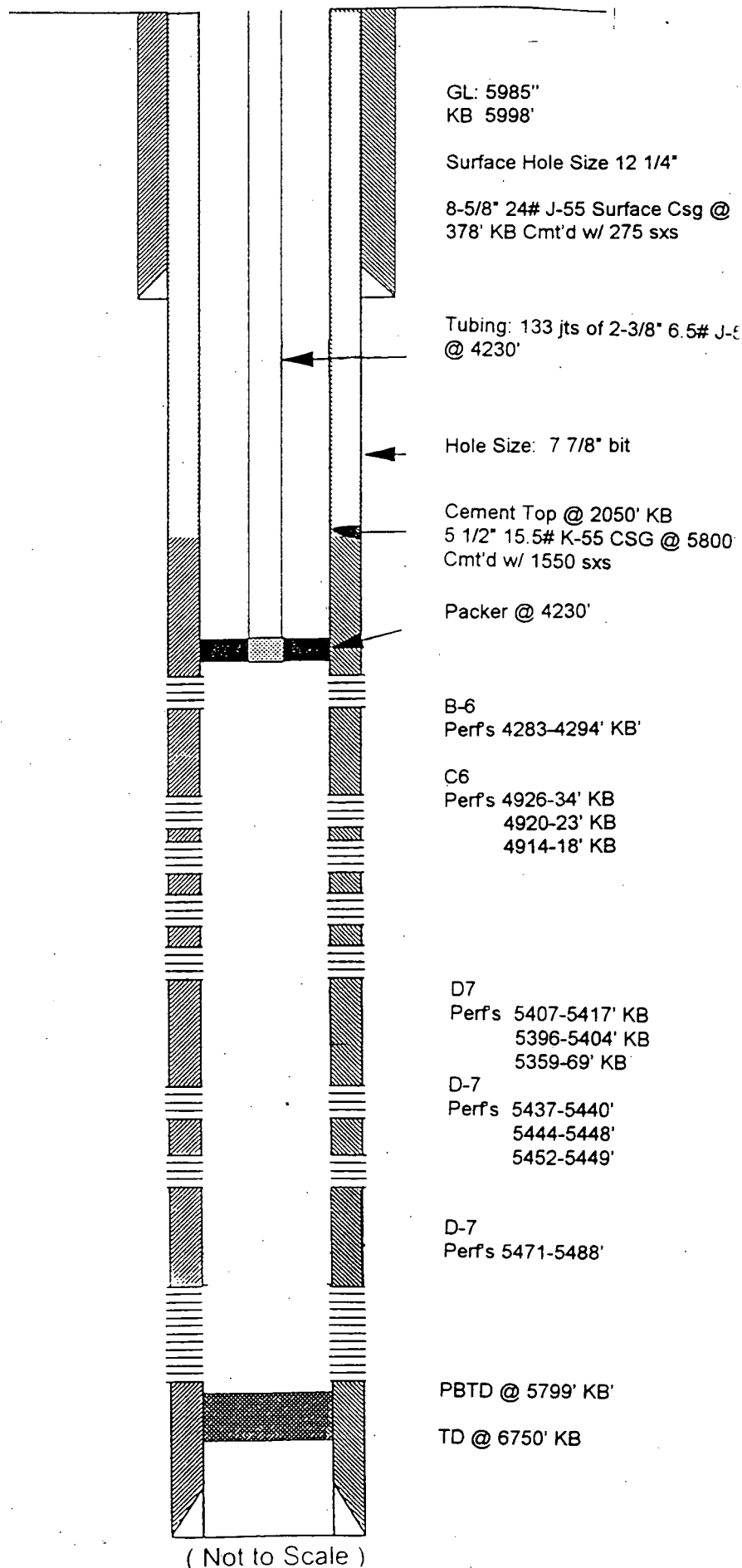
**Well History**

8/21/91 Spud Well

9/21/91 Perf'd D7 5471-88, 5449-52, 5444-48, 5437-40  
Brk Dwn 2% Kcl water  
Frac'd 120,000 # sand  
ISIP 2,320 psi

10/27/91 Perf'd B6 4283-94  
Frac'd 114,500# sand  
ISIP 1000 psi

8/24/95 Pump Changes



**Petroglyph Operating Co., Inc.**

**Ute Tribal 05-08**

(2500' FNL & 550' FEL)

SE NE Section 5-T5S-R3W  
Antelope Creek Field  
Duchesne Co, Utah

API #43-013 31306: Lease #14-20-H62-4650

Ute Tribal #29-08A  
Wellbore Diagram  
After Conversion

Well History:

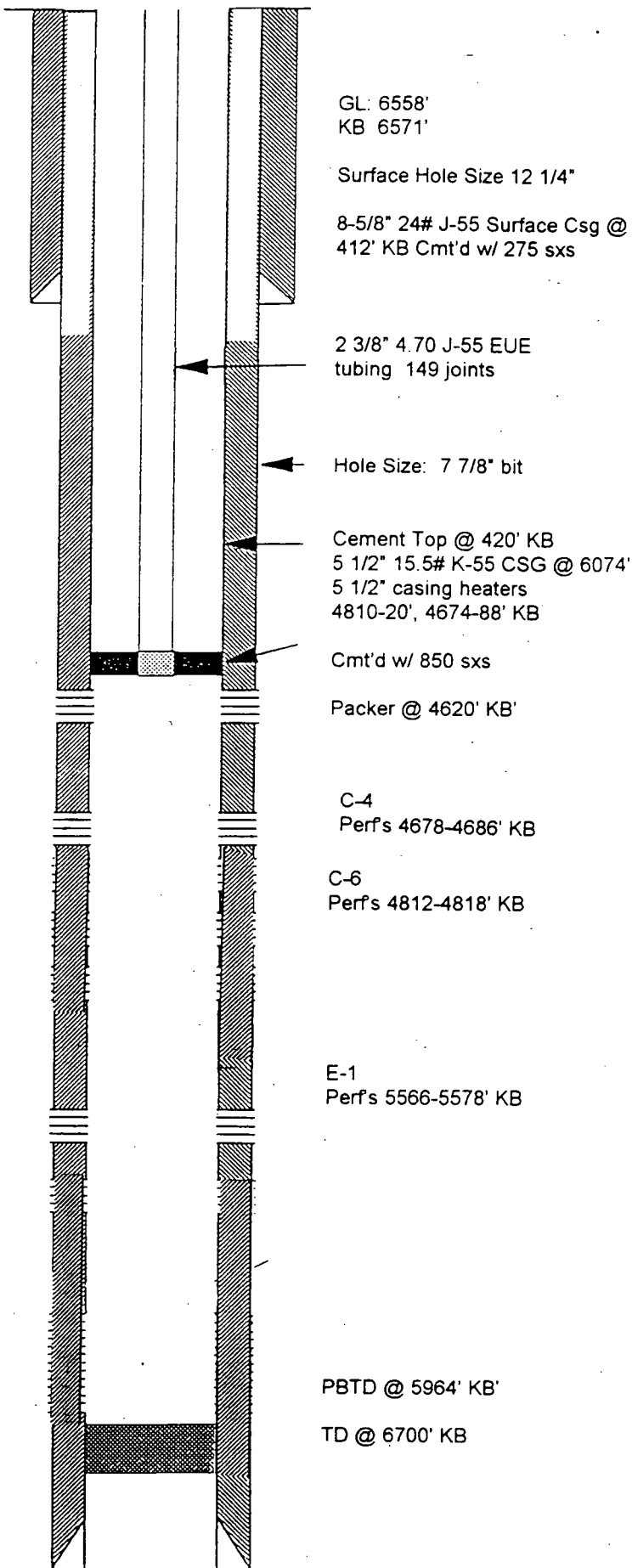
9/9/91 Spud Well "Coors"

9/12/91 Ran 5 1/2" casing with electric heater sections in 5 1/2" casing string 4810-20, 4674-88' KB.

9/25/91 Perf'd 4812-18'  
Brk Dwn 7 1/2% HCl  
Frac'd 85,000# sand  
ISIP 2,000 psi

10/4/91 Perf'd 4678-86'  
Brk Dwn 7 1/2% Acid  
Frac'd 100,00# sand  
ISIP 2,910 psi

10/15/91 Put well on production



Petroglyph Operating Co., Inc.

**Ute Tribal 29-08A**

(2600' FNL & 600' FEL)

SE NE Section 29-T5S-R3W

Antelope Creek Field

Duchesne Co, Utah

API #43-013-31305; Lease #14-20-H62-3518

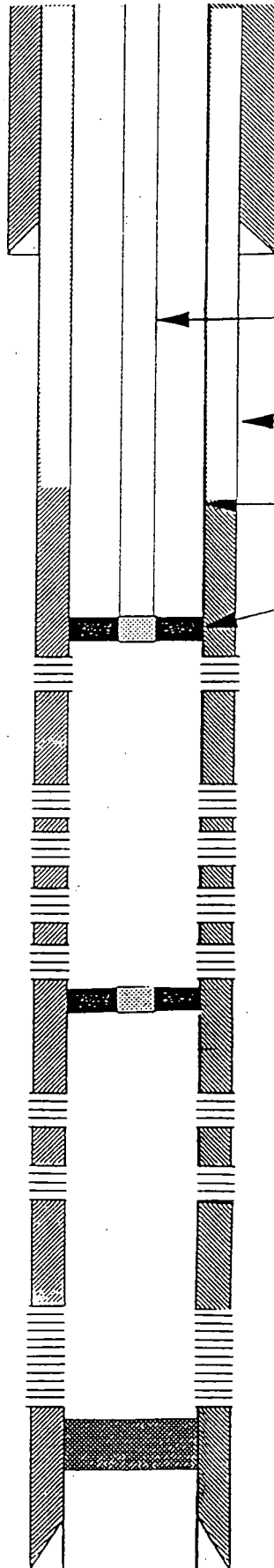
( Not to Scale )



**Ute Tribal #05-16  
Wellbore Diagram  
After Conversion**

**Well History:**

5/24/95	Spud Well
10/12/95	Perf'd D-7 5438-42, 5414-17', 5396-5400', 5390-92', 5374-80', Brk Dwn 2% KCl water Frac'd 57,400# sand , ISIP 2,495 psi
10/13/95	Perf'd D-3 5201-06' KB Brk Dwn 2% KCL water Frac'd 29,500# sand ISIP 1980
10/19/95	Squeeze cemented D-3 Perfs
10/20/95	Perf'd C-5 4827-32, 4816-20 Perf'd C-6 4934-38, 4908-12, 4918-23 Brk Dwn 2% KCL water Frac'd 67,800# sand ISIP 2070 psi
4/1/96	Re Frac C-6 sand Frac'd 25,500# sand ISIP 1,662 psi



GL: 6049'  
KB 6059'

Surface Hole Size 12 1/4"

8-5/8" 24# J-55 Surface Csg @  
434 KB Cmt'd w/ 225 sxs

Tubing: 154 jts of 2-3/8" 6.5# J-55  
@ 4770' KB

Hole Size: 7 7/8" bit

Cement Top @ 2750' KB  
5 1/2" 15.5# K-55 CSG @ 6147"  
Cmt'd w/ 440 sxs

Packer @ 4770' KB

C-5  
Perf's 4827-32' KB  
4816-20' KB

C6  
Perf's 4934-38' KB  
4908-12' KB  
4918-23' KB

RTBP set at 5080' KB

D-3  
Perf's 5201-06' KB  
Cement Squeezed'

D-7  
Perf's 5438-42' KB  
5414-17'  
5396-5400'  
5390-92'  
5374-80'

PBTD @ 6088' KB'

TD @ 6190' KB

**Petroglyph Operating Co., Inc.**

**Ute Tribal 05-16**

(708' FSL & 523' FEL)

SE SE Section 5-T5S-R3W  
Antelope Creek Field  
Duchesne Co, Utah

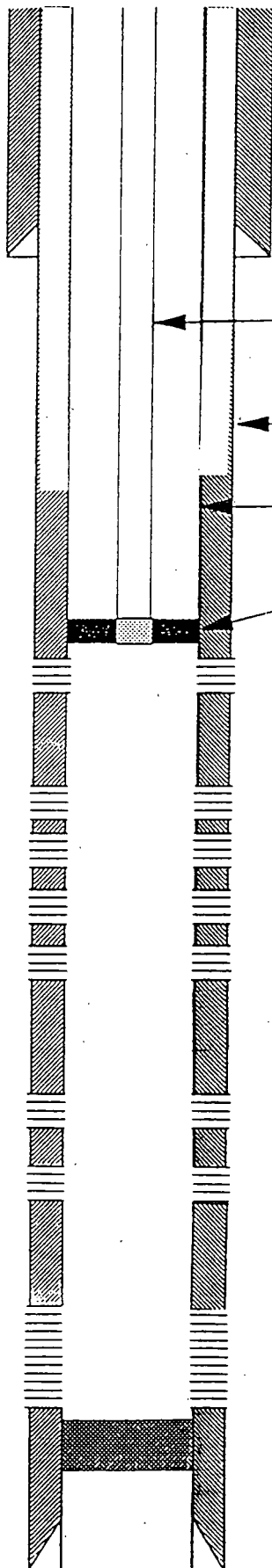
API #43-013 31527: Lease #14-20-H62-3504

( Not to Scale )

**Ute Tribal #04-05  
Wellbore Diagram  
After Conversion**

**Well History:**

5/2/95	Spud Well
10/26/95	Perf'd D-7 5500-04, 5454-60, 5418-22 5382-88, 5359-68, 5348-50, Brk Dwn 2% KCl water Frac'd 158,400# sand ISIP 1,950 psi
10/30/95	Perf'd D-3 5228-31 Brk Dwn 2% KCL water Frac'd 22,940# sand ISIP Screen out
11/3/95	Perf'd C5 4848-52 Perf'd C6 4942-48 Brk Dwn 2% KCL water Frac'd 66020# sand ISIP 1,772 psi
11/9/95	Perf'd B11 4564-72 Frac'd 27,700# sand ISIP 1,918 psi
11/14/95	Perf'd B6 4328-36 Frac'd 33,280# sand ISIP 2,078 psi
12/30/95	Date of First Production



GL: 5997'  
KB 6007'

Surface Hole Size 12 1/4"

8-5/8" 24# J-55 Surface Csg @  
425 KB Cmt'd w/ 350 sxs

Tubing: 139 jts of 2-3/8" 4.7# J-55  
@ 4298' KB'

Hole Size: 7 7/8" bit

Cement Top @ 2450' KB  
5 1/2" 15.5# K-55 CSG @ 5736"  
Cmt'd w/ 1450 sxs

Packer @ 4298'

B-6  
Perf's 4328-36' KB'

B-11  
Perf's 4564-72' KB

C-5  
Perf's 4848-52' KB

C6  
Perf's 4942-48

D-3  
Perf's 5228-31' KB

D-7  
Perf's 5504-5348' KB

PBTD @ 6190' KB'

TD @ 6453' KB

**Petroglyph Operating Co., Inc.**

**Ute Tribal 04-05**

(2725' FNL & 660' FWL)

SW NW Section 4-T5S-R3W  
Antelope Creek Field  
Duchesne Co, Utah

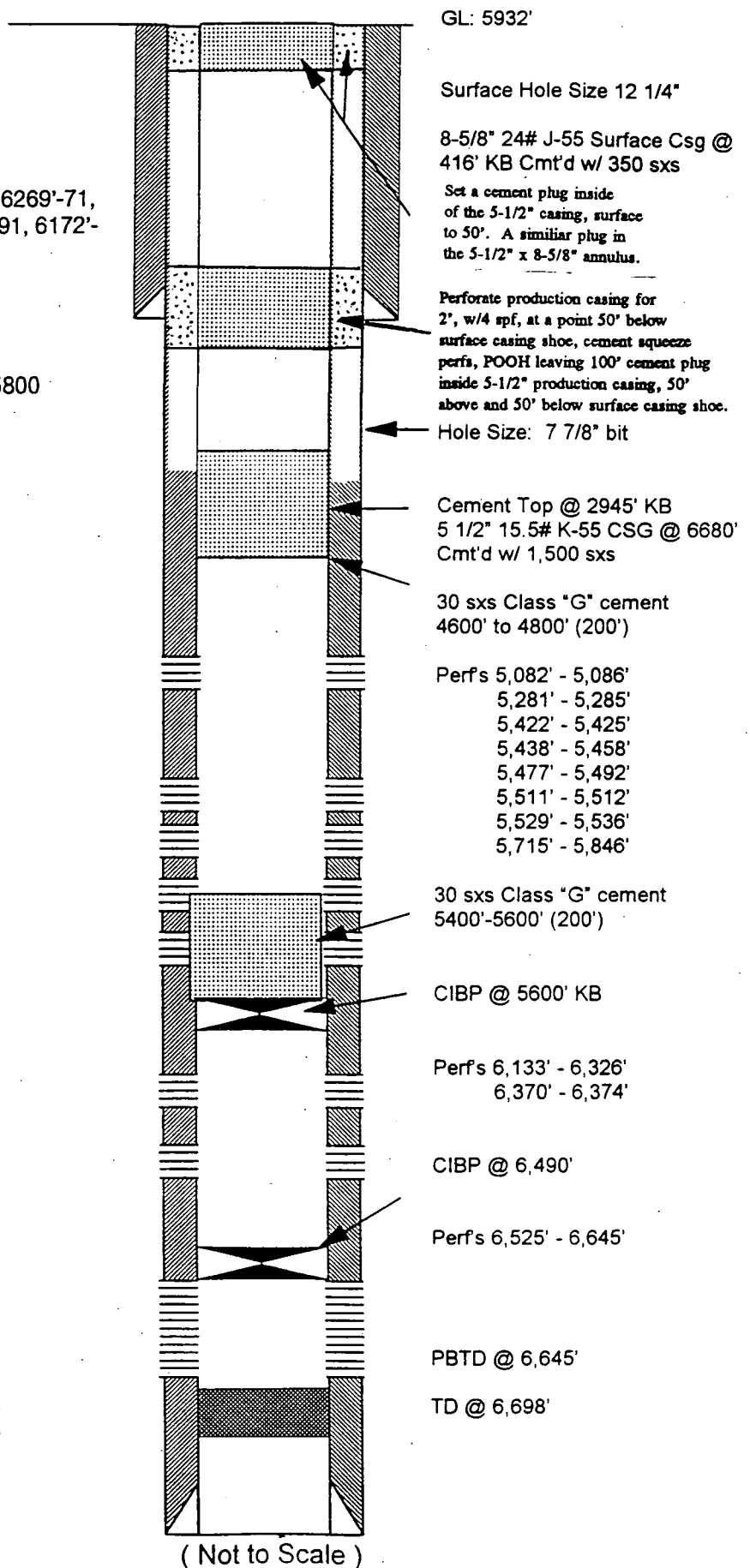
API #43-013 31462: Lease #14-20-H62-3503

( Not to Scale )

**Ute Tribal #04-01  
Wellbore Diagram  
Plugged**

**Well History:**

5/30/83	Spud Well "Coors"
6/24/83	Perf'd 6645'-35, 6525'-30, 6370'-74, Brk Dwn 2% KCl water Frac'd 76,500# sand ISIP 2,500 psi
6/30/83	Perf'd 6325'-26, 6311'-12, 6285'-86, 6269'-71, 6253'-54, 6248'-49, 6229'-31, 6190'-91, 6172'- 74, 6160'-67, 6133'-40 Brk Dwn 7½% HCl Frac'd 90,000# sand ISIP 2,500 psi
9/8/83	Perf'd 5846, 43, 40, 36, 04, 03, 02, 5800 Perf'd 5743, 33, 29, 25, 21, 15 Brk Dwn 7½% Acid Frac'd 100,716# sand ISIP 2,700 psi
11/18/83	Perf'd 5477'-92, 5111'-15, 5529'-36 Frac'd 36,000# sand ISIP 2,000 psi
8/22/84	Perf'd 5082'-86, 5281'-85 Frac'd 100,000# sand
7/26/90	Pump Changes
2/7/92	Well Shut In
11/27/92	Acid job Put well back on production



Tubing Detail: 2' psp Packer, 156 jts

<p align="center"><b>Petroglyph Operating Co., Inc.</b></p> <p align="center"><b>Ute Tribal 04-01</b></p> <p align="center">(1331' FNL &amp; 1277' FEL)</p> <p align="center">NE NE Section 24-T5S-R3W Antelope Creek Field Duchesne Co, Utah API #43-013 30762; Lease #14-20-H62-3503</p>
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Ute Tribal #05-08  
Wellbore Diagram  
Plugged

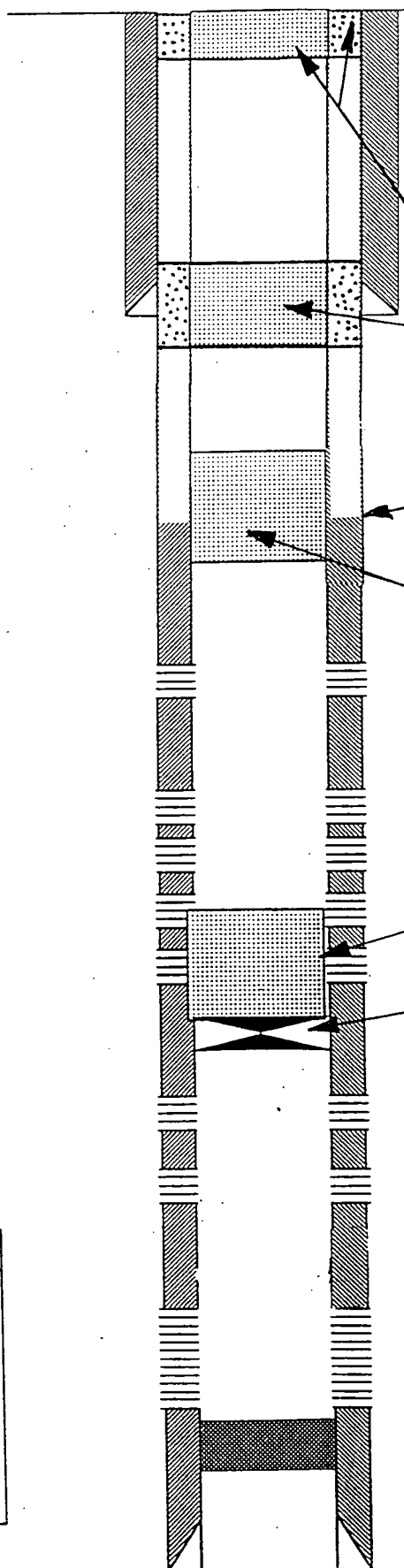
Well History

8/21/91 Spud Well

9/21/91 Perf'd D7 5471-88, 5449-52, 5444-48, 5437-40  
Brk Dwn 2% Kcl water  
Frac'd 120,000 # sand  
ISIP 2,320 psi

10/27/91 Perf'd B6 4283-94  
Frac'd 114,500# sand  
ISIP 1000 psi

8/24/95 Pump Changes



GL: 5985"  
KB 5998'

Surface Hole Size 12 1/4"

8-5/8" 24# J-55 Surface Csg (378' KB Cmt'd w/ 275 sxs)

Set a cement plug inside of the 5-1/2" casing, surface to 50'. A similar plug in the 5-1/2" x 8-5/8" annulus.

Perforate production casing for 2', w/4 spf, at a point 50' below surface casing shoe, cement squeeze perfs, POOH leaving 100' cement plug inside 5-1/2" production casing, 50' above and 50' below surface casing shoe.

Cement Top @ 2050' KB  
5 1/2" 15.5# K-55 CSG @ 5800'  
Cmt'd w/ 1550 sxs

30 sxs Class G cement'  
3800' to 4000' KB (200')

B-6  
Perf's 4283-4294' KB'

C6  
Perf's 4926-34' KB  
4920-23' KB  
4914-18' KB

CIBP 5300' KB  
30 sxs Class "G" cement  
5300' 5100' KB (200')

D7  
Perf's 5407-5417' KB  
5396-5404' KB  
5359-69' KB

D-7  
Perf's 5437-5440'  
5444-5448'  
5452-5449'

D-7  
Perf's 5471-5488'

PBTD @ 5799' KB'

TD @ 6750' KB

Petroglyph Operating Co., Inc.

**Ute Tribal 05-08**

(2500' FNL & 550' FEL)

SE NE Section 5-T5S-R3W  
Antelope Creek Field  
Duchesne Co, Utah

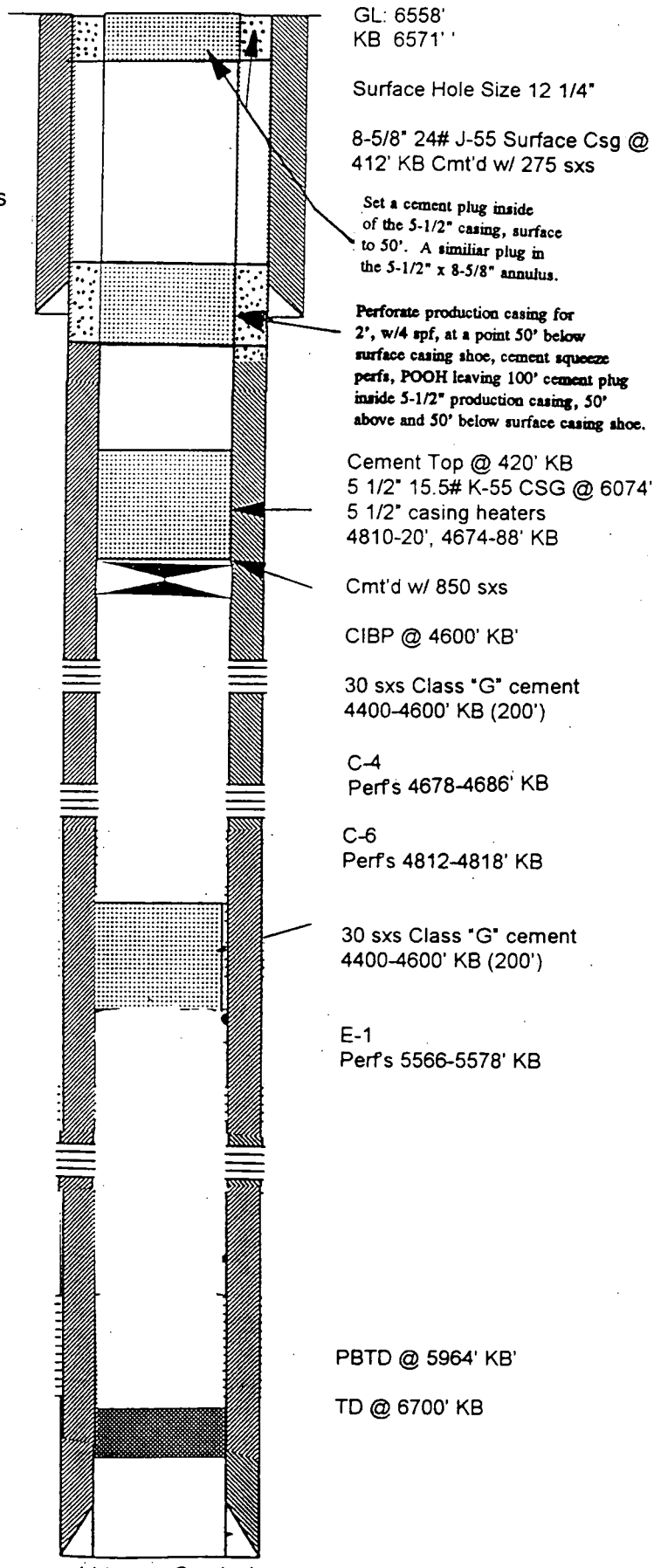
API #43-013 31306: Lease #14-20-H62-4650

( Not to Scale )

**Ute Tribal #29-08A  
Wellbore Diagram  
Plugged**

**Well History:**

9/9/91	Spud Well "Coors"
9/12/91	Ran 5 1/2" casing with electric heater sections in 5 1/2" casing string 4810-20, 4674-88' KB.
9/25/91	Perf'd 4812-18' Brk Dwn 7 1/2% HCl Frac'd 85,000# sand ISIP 2,000 psi
10/4/91	Perf'd 4678-86' Brk Dwn 7 1/2% Acid Frac'd 100,00# sand ISIP 2,910 psi
10/15/91	Put well on production



(Not to Scale)

**Petroglyph Operating Co., Inc.**

**Ute Tribal 29-08A**

(2600' FNL & 600' FEL)

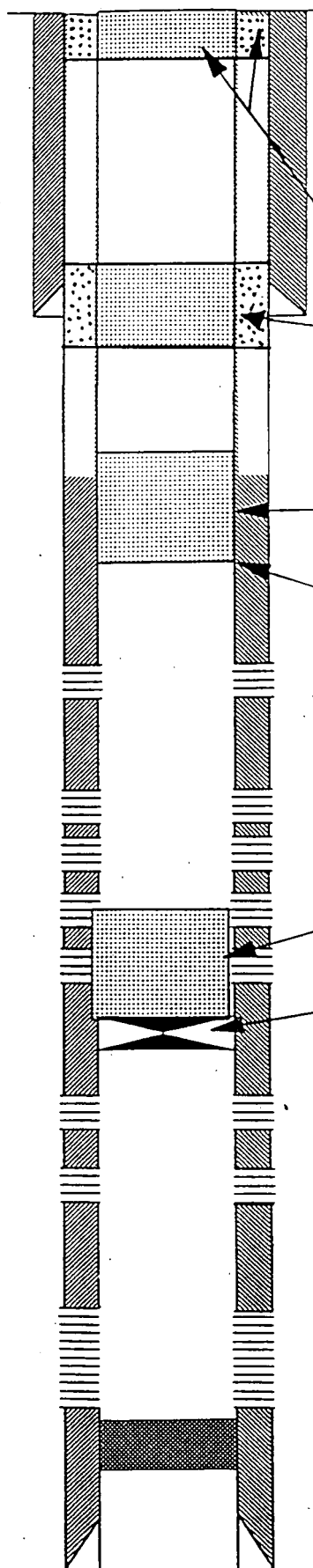
SE NE Section 29-T5S-R3W  
Antelope Creek Field  
Duchesne Co, Utah

API #43-013-31305; Lease #14-20-H62-3518

**Ute Tribal #05-16  
Wellbore Diagram  
Plugged**

**Well History:**

5/24/95	Spud Well
10/12/95	Perf'd D-7 5438-42, 5414-17', 5396-5400', 5390-92', 5374-80', Brk Dwn 2% KCl water Frac'd 57,400# sand ISIP 2,495 psi
10/13/95	Perf'd D-3 5201-06' KB Brk Dwn 2% KCL water Frac'd 29,500# sand ISIP 1980
10/19/95	Squeeze cemented D-3 Perfs
10/20/95	Perf'd C-5 4827-32, 4816-20 Perf'd C-6 4934-38, 4908-12, 4918-23 Brk Dwn 2% KCL water Frac'd 67,800# sand ISIP 2070 psi
4/1/96	Re Frac C-6 sand Frac'd 25,500# sand ISIP 1,662 psi



GL: 6049'  
KB 6059'

Surface Hole Size 12 1/4"

8-5/8" 24# J-55 Surface Csg @  
434 KB Cmt'd w/ 225 sxs

Set a cement plug inside  
of the 5-1/2" casing, surface  
to 50'. A similar plug in  
the 5-1/2" x 8-5/8" annulus.

Perforate production casing for  
2', w/4 spf, at a point 50' below  
surface casing shoe, cement squeeze  
perfs, POOH leaving 100' cement plug  
inside 5-1/2" production casing, 50'  
above and 50' below surface casing shoe.

Cement Top @ 2750' KB  
5 1/2" 15.5# K-55 CSG @ 6147'  
Cmt'd w/ 440 sxs

30 sxs Class "G" cement  
4800'-4600' (200')

C-5  
Perf's 4827-32' KB  
4816-20' KB

C6  
Perf's 4934-38' KB  
4908-12' KB  
4918-23' KB

D-3  
Perf's 5201-06' KB  
Cement Squeezed'

30 sxs Class "G" cement  
5300-5100' (200;)  
CIBP 5300'

D-7  
Perf's 5438-42' KB  
5414-17'  
5396-5400'  
5390-92'  
5374-80'

PBTD @ 6088' KB'

TD @ 6190' KB

Petroglyph Operating Co., Inc.

**Ute Tribal 05-16**

(708' FSL & 523' FEL)

SE SE Section 5-T5S-R3W

Antelope Creek Field

Duchesne Co, Utah

API #43-013 31527; Lease #14-20-H62-3504

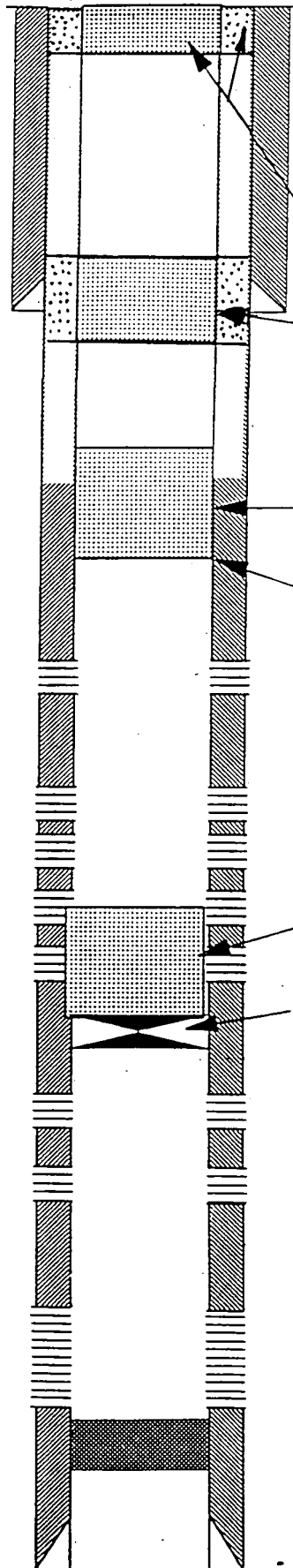
( Not to Scale )



**Ute Tribal #04-05  
Wellbore Diagram  
Plugged**

**Well History:**

5/2/95	Spud Well
10/26/95	Perf'd D-7 5500-04, 5454-60, 5418-22 5382-88, 5359-68, 5348-50, Brk Dwn 2% KCl water Frac'd 158,400# sand ISIP 1,950 psi
10/30/95	Perf'd D-3 5228-31 Brk Dwn 2% KCL water Frac'd 22,940# sand ISIP Screen out
11/3/95	Perf'd C5 4848-52 Perf'd C6 4942-48 Brk Dwn 2% KCL water Frac'd 66020# sand ISIP 1,772 psi
11/9/95	Perf'd B11 4564-72 Frac'd 27,700# sand ISIP 1,918 psi
11/14/95	Perf'd B6 4328-36 Frac'd 33,280# sand ISIP 2,078 psi
12/30/95	Date of First Production



GL: 5997'  
KB 6007'

Surface Hole Size 12 1/4"

8-5/8" 24# J-55 Surface Csg @  
425 KB Cmt'd w/ 350 sxs

Set a cement plug inside  
of the 5-1/2" casing, surface  
to 50'. A similar plug in  
the 5-1/2" x 8-5/8" annulus.

Perforate production casing for  
2', w/4 spf, at a point 50' below  
surface casing shoe, cement squeeze  
perfs, POOH leaving 100' cement plug  
inside 5-1/2" production casing, 50'  
above and 50' below surface casing shoe.

Cement Top @ 2450' KB  
5 1/2" 15.5# K-55 CSG @ 5736"  
Cmt'd w/ 1450 sxs

30 sxs Class "G" cement  
3800' - 4000' KB (200')

B-6  
Perf's 4328-36' KB'

B-11  
Perf's 4564-72' KB

C-5  
Perf's 4848-52' KB

C6  
Perf's 4942-48

30 sxs Class "G" cement  
5300' 5100' KB (200')  
CIBP 5300' KB

D-3  
Perf's 5228-31' KB

30 sxs Class "G" cement  
5300' 5100' KB (200')  
CIBP 5300' KB

D-7  
Perf's 5504-5348' KB

PBTD @ 6190' KB'

TD @ 6453' KB

**Petroglyph Operating Co., Inc.**

**Ute Tribal 04-05**

(2725' FNL & 660' FWL)

SW NW Section 4-T5S-R3W  
Antelope Creek Field  
Duchesne Co, Utah

API #43-013 31462: Lease #14-20-H62-3503

( Not to Scale )



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

999 18th STREET - SUITE 500  
DENVER, COLORADO 80202-2466

JUL - 6 1995

Ref: 8WM-DW

MEMORANDUM

SUBJECT: Final Guidance for Conducting a Pressure Test to Determine if a Well Has Leaks in the Tubing, Casing or Packer

FROM: Tom Pike, Chief UIC Direct Implementation *Tom Pike*

TO: UIC Direct Implementation Permit Writers

Introduction

The Underground Injection Control (UIC) regulations require that an injection well have mechanical integrity at all times (40 CFR 144.28 (f)(2) and 40 CFR 144.51 (q)(1)). A well has mechanical integrity (40 CFR 146.8) if:

- (1) There is no significant leak in the tubing, casing or packer; and
- (2) There is no significant fluid movement into an underground source of drinking water (USDW) through vertical channels adjacent to the injection wellbore.

Definition: Mechanical Integrity Pressure Test for Part I. A pressure test used to determine the integrity of all the downhole components of an injection well, usually tubing, casing and packer. It is also used to test tubing cemented in the hole by using a tubing plug or retrievable packer. Pressure tests must be run at least once every five years. If for any reason the tubing/packer is pulled, the injection well is required to pass another mechanical integrity test of the tubing casing and packer prior to recommencing injection regardless of when the last test was conducted. Tests run by operators in the absence of an EPA inspector must be conducted according to these procedures and recorded on either the attached form or an equivalent form containing the necessary information. A pressure recording chart documentating the actual annulus test pressures must be attached to the form.

This guidance addresses making a determination of Part I of Mechanical Integrity (no leaks in the tubing, casing or



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packer). The Region's policy is: 1) to determine if there are significant leaks in the tubing, casing or packer; 2) to assure that the casing can withstand pressure similar to that which would be applied if the tubing or packer fails; 3) to make the Region's test procedure consistent with the procedures utilized by other Region VIII Primacy programs; and 4) to provide a procedure which can be easily administered and is applicable to all class I and II wells. Although there are several methods allowed for determining mechanical integrity, the principal method involves running a pressure test of the tubing/casing annulus. Region VIII's procedure for running a pressure test is intended to aid UIC field inspectors who witness pressure tests for the purpose of demonstrating that a well has Part I of Mechanical Integrity. The guidance is also intended as a means of informing operators of the procedures required for conducting the test in the absence of an EPA inspector.

### Pressure Test Description

#### Test Frequency

The mechanical integrity of an injection well must be maintained at all times. Mechanical integrity pressure tests are required at least every five (5) years. If for any reason the tubing/packer is pulled, however, the injection well is required to pass another mechanical integrity test prior to recommencing injection regardless of when the last test was conducted. The Regional UIC program must be notified of the workover and the proposed date of the pressure test. The well's test cycle would then start from the date of the new test if the well passes the test and documentation is adequate. Tests may be required on a more frequent basis depending on the nature of the injectate and the construction of the well (see Section guidance on MITs for wells with cemented tubing and regulations for Class I wells).

Region VIII's criteria for well testing frequency is as follows:

1. Class I hazardous waste injection wells; initially [40 CFR 146.68(d)(1)] and annually thereafter;
2. Class I non-hazardous waste injection wells; initially and every two (2) years thereafter, except for old permits (such as the disposal wells at carbon dioxide extraction plants which require a test at least every five years);
3. Class II wells with tubing, casing and packer; initially and at least every five (5) years thereafter;



4. Class II wells with tubing cemented in the hole; initially and every one (1) or two (2) years thereafter depending on well specific conditions (See Region VIII UIC Section Guidance #36);
5. Class II wells which have been temporarily abandoned (TAd) must be pressure tested after being shut-in for two years; and
6. Class III uranium extraction wells; initially.

#### Test Pressure

To assure that the test pressure will detect significant leaks and that the casing is subjected to pressure similar to that which would be applied if the tubing or packer fails, the tubing/casing annulus should be tested at a pressure equal to the maximum allowed injection pressure or 1000 psig whichever is less. The annular test pressure must, however, have a difference of at least 200 psig either greater or less than the injection tubing pressure. Wells which inject at pressures of less than 300 psig must test at a minimum pressure of 300 psig, and the pressure difference between the annulus and the injection tubing must be at least 200 psi.

#### Test Criteria

1. The duration of the pressure test is 30 minutes.
2. Both the annulus and tubing pressures should be monitored and recorded every five (5) minutes.
3. If there is a pressure change of 10 percent or more from the initial test pressure during the 30 minute duration, the well has failed to demonstrate mechanical integrity and should be shut-in until it is repaired or plugged.
4. A pressure change of 10 percent or more is considered significant. If there is no significant pressure change in 30 minutes from the time that the pressure source is disconnected from the annulus, the test may be completed as passed

### Recordkeeping and Reporting

The test results must be recorded on the attached form. The annulus pressure should be recorded at five (5) minute intervals. Tests run by operators in the absence of an EPA inspector must be conducted according to these procedures and recorded on the attached form or an equivalent form. A pressure recording chart documenting the actual annulus test pressures must be attached to the submittal. The tubing pressure at the beginning and end of each test must be recorded. The volume of the annulus fluid bled back at the surface after the test should be measured and recorded on the form. This can be done by bleeding the annulus pressure off and discharging the associated fluid into a five gallon container. The volume information can be used to verify the approximate location of the packer.

### Procedures for Pressure Test

1. Scheduling the test should be done at least two (2) weeks in advance.
2. Information on the well completion (location of the packer, location of perforations, previous cement work on the casing, size of casing and tubing, etc.) and the results of the previous MIT test should be reviewed by the field inspector in advance of the test. Regional UIC Guidance #35 should also be reviewed. Information relating to the previous MIT and any well workovers should be reviewed and taken into the field for verification purposes.
3. All Class I wells and Class II SWD wells should be shut-in prior to the test. A 12 to 24-hour shut-in is preferable to assure that the temperature of the fluid in the wellbore is stable.
4. Class II enhanced recovery wells may be operating during the test, but it is recommended that the well be shut-in if possible.
5. The operator should fill the casing/tubing annulus with inhibited fluid at least 24 hours in advance, if possible. Filling the annulus should be undertaken through one valve with the second valve open to allow air to escape. After the operator has filled the annulus, a check should be made to assure that the annulus will remain full. If the annulus can not maintain a full column of fluid, the operator should notify the Director and begin a rework. The operator should measure and report the volume of fluid added to

the annulus. If not already the case, the casing/tubing valves should be closed, at least, 24 hours prior to the pressure test.

Following steps are at the well:

6. Read tubing pressure and record on the form. If the well is shut-in, the reported information on the actual maximum operating pressure should be used to determine test pressures.
7. Read pressure on the casing/tubing annulus and record value on the form. If there is pressure on the annulus, it should be bled off prior to the test. If the pressure will not bleed-off, the guidance on well failures (Region VIII UIC Section Guidance #35) should be followed.
8. Ask the operator for the date of the last workover and the volume of fluid added to the annulus prior to this test and record information on the form.
9. Hook-up well to pressure source and apply pressure until test value is reached.
10. Immediately disconnect pressure source and start test time. (If there has been a significant drop in pressure during the process of disconnection, the test may have to be restarted.) The pressure gages used to monitor injection tubing pressure and annulus pressure should have a pressure range which will allow the test pressure to be near the mid-range of the gage. Additionally, the gage must be of sufficient accuracy and scale to allow an accurate reading of a 10 percent change to be read. For instance, a test pressure of 600 psi should be monitored with a 0 to 1000 psi gage. The scale should be incremented in 20 psi increments.
11. Record tubing and annulus pressure values every five (5) minutes.
12. At the end of the test, record the final tubing pressure.
13. If the test fails, check the valves, bull plugs and casing head close up for possible leaks. The well should be retested.
14. If the second test indicates a well failure, the Region should be informed of the failure within 24 hours by the operator, and the well should be shut-in within 48 hours per Headquarters guidance #76. A follow-up

letter should be prepared by the operator which outlines the cause of the MIT failure and proposes a potential course of action. This report should be submitted to EPA within five days.

15. Bleed off well into a bucket, if possible, to obtain a volume estimate. This should be compared to the calculated value obtained using the casing/tubing annulus volume and fluid compressibility values.
16. Return to office and prepare follow-up.

Attachment





## NAME AND ADDRESS OF PERMITTEE

NAME AND ADDRESS OF CONTRACTOR

LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRES

STATE

COUNTY

PERMIT NUMBER
---------------

SURFACE LOCATION DESCRIPTION

1/4 OF

1/4 OF

**¼ SECTION**

TOWNSHIP

RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

## Surface

Location \_\_\_\_\_ ft. from (N/S) \_\_\_\_\_ Line of quarter section

and \_\_\_\_\_ ft. from (E/W) \_\_\_\_\_ Line of quarter section

## WELL ACTIVITY

- ☐ Brine Disposal
- ☐ Enhanced Recovery
- ☐ Hydrocarbon Storage

**Lease Name****Total Depth Before Rework**

#### Total Depth After Rework

Date Rework Commenced

Date Rework Completed

## TYPE OF PERMIT

- ☐ Individual  
☐ Area  
 Number of Wells \_\_\_\_\_

Well Number

### WELL CASING RECORD — BEFORE REWORK

[illegible]

## WELL CASING RECORD — AFTER REWORK (Indicate Additions and Changes Only)

[illegible]

DESCRIBE REWORK OPERATIONS IN DETAIL  
USE ADDITIONAL SHEETS IF NECESSARY

## WIRE LINE LOGS, LIST EACH TYPE

## Log Types

### Logged Intervals

## CERTIFICATION

*I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).*

NAME AND OFFICIAL TITLE (Please type or print)

**SIGNATURE**

DATE SIGNED \_\_\_\_\_

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, DC 20460**WELL REWORK RECORD**

NAME AND ADDRESS OF PERMITTEE

NAME AND ADDRESS OF CONTRACTOR

LOCATE WELL AND OUTLINE UNIT ON  
SECTION PLAT — 640 ACRES

N									
S									

W E

STATE

COUNTY

PERMIT NUMBER

SURFACE LOCATION DESCRIPTION

¼ OF

¼ OF

¼ SECTION

TOWNSHIP

RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface

Location \_\_\_\_ ft. from (N/S) \_\_\_\_ Line of quarter section

and \_\_\_\_ ft. from (E/W) \_\_\_\_ Line of quarter section

WELL ACTIVITY

- ☐ Brine Disposal  
☐ Enhanced Recovery  
☐ Hydrocarbon Storage

Lease Name

Total Depth Before Rework

Total Depth After Rework

Date Rework Commenced

Date Rework Completed

TYPE OF PERMIT

- ☐ Individual  
☐ Area  
 Number of Wells \_\_\_\_

Well Number

**WELL CASING RECORD — BEFORE REWORK**

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	

**WELL CASING RECORD — AFTER REWORK** (Indicate Additions and Changes Only)

Casing		Cement		Perforations		Acid or Fracture Treatment Record
Size	Depth	Sacks	Type	From	To	

DESCRIBE REWORK OPERATIONS IN DETAIL  
USE ADDITIONAL SHEETS IF NECESSARY

WIRE LINE LOGS, LIST EACH TYPE

Log Types

Logged Intervals

**CERTIFICATION**

*I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).*

NAME AND OFFICIAL TITLE (Please type or print)

SIGNATURE

DATE SIGNED